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ABSTRACT

This collection of papers begins with a presentation on the role of mass media campaigns in drug abuse prevention, emphasizing the need for skill development and family involvement. The next presentation addresses general and specific influences on health behavior including society, the family, peers, the school, and the individual. A three-dimensional model for health promotion is described. Community prevention projects in heart disease are presented with implications for drug abuse prevention. Research on the interplay of social, personality, and developmental factors is reviewed. The effects of alternative programming as a prevention strategy are given. School/parent group programs and research on their effectiveness are discussed. The values of drug abusers, from the perspective of belief system theory are addressed. Social skills training and educational needs are discussed. The monograph concludes with a summary of the discussions and recommendations of the participants for future research efforts. (BL)

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RAUS

RESEARCH ANALYSIS
and
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Preventing Adolescent Drug Abuse:

Intervention Strategies

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U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service • Alcohol, Drug Abuse, and Mental Health Administration

Preventing Adolescent Drug Abuse

Intervention Strategies

Editors:

Thomas J. Glynn, Ph.D.

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NIDA Research Monograph 47

A RAUS Review Report

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Public Health Service
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National Institute on Drug Abuse
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Preventing Adolescent Drug Abuse

Intervention Strategies

ACKNOWLEDGMENT

This monograph is based upon papers and discussion from the RAUS Review Conference on strategies for prevention of adolescent drug abuse, held April 14 and 15, 1983, in Rockville, Maryland, sponsored by the Office of Science, National Institute on Drug Abuse.

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Preface

The Research Analysis and Utilization System (RAUS) is designed to serve four functions:

- Collect and systematically classify the findings of all intramural and extramural research supported by the National Institute on Drug Abuse (NIDA);
- Evaluate the findings in selected areas of particular interest and formulate a state-of-the-art review by a panel of scientific peers;
- Disseminate findings to researchers in the field and to administrators, planners, instructors, and other interested persons;
- Provide a feedback mechanism to NIDA staff and planners so that the administration and monitoring of the NIDA research program reflect the very latest knowledge gleaned from research in the field.

Since there is a limit to the number of reseach findings that can be intensively reviewed annually, four subject areas are chosen each year to undergo a thorough examination. Distinguished scientists in the selected field are provided with copies of reports from NIDA-funded research and invited to add any information derived from the literature and from their own research in order to formulate a comprehensive view of the field. Each reviewer is charged with writing a state-of-the-art paper in his or her particular subject area. These papers, together with a summary of the discussions and recommendations which take place at the review meeting, make up a RAUS Review Report in the NIDA Research Monograph series.

"Preventing adolescent drug abuse" was chosen as a subject for a comprehensive RAUS review in FY 1983 because a large body of knowledge has developed relative to preventing tobacco smoking in youth and the time seemed propitious for review of the state-of-the-art in light of its possible applicability to the prevention of other forms of drug abuse. The results of this review are presented in this monograph.

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Executive Summary

Jacqueline P. Ludford, M.S.

From a public health view, the prevention of drug abuse among adolescents is an enormous and pressing problem. Recognizing that it was time to review prevention strategies which have been used with a certain degree of success in the tobacco smoking area and evaluate their applicability to drug abuse prevention strategies, NIDA convened a RAUS meeting on "Preventing Adolescent Drug Abuse" on April 14-15, 1983. The presentations included:

o	Media Approaches to Adolescent Substance Abuse Prevention	Dr. Brian Flay University of Southern California
o	Social Psychologically-Based Approaches to Adolescent Substance Abuse Prevention	Dr. Alfred McAlister University of Texas
o	Health Promotion Approaches to Adolescent Substance Abuse Prevention	Dr. Cheryl Perry University of Minnesota Dr. Richard Jessor University of Colorado
o	Community-Level Interventions in the Prevention of Adolescent Substance Abuse	Dr. C. Anderson Johnson University of Southern California
o	Prevention of Adolescent Substance Abuse Through Life Skills Development	Dr. Gilbert Botvin Cornell University Medical College
o	Provision of Alternative Activities as an Adolescent Substance Abuse Prevention Approach	Dr. John Swisher Pennsylvania State University
o	Family-Based Approaches to Adolescent Substance Abuse Prevention	Dr. Brenna Bry Rutgers University

o	Value Approaches to Adolescent Substance Abuse Prevention	Dr. Milton Rokeach Washington State Univ.
o	Prevention of Adolescent Substance Abuse through Social Skill Development	Dr. Mary Ann Pentz University of Tennessee
o	Prevention of Adolescent Substance Abuse through Drug Education	Dr. Joel Moskowitz "The NAPA Project"

Dr. Richard Jessor, of the University of Colorado, and Dr. Thomas Glynn, of the Division of Clinical Research, NIDA (now at the National Cancer Institute), served as cochairmen for the meeting and led the discussions.

Dr. Flay discussed the role of mass media campaigns in drug abuse prevention. He emphasized the importance of media in the lives of children and suggested that campaigns must not only give information but also give skills to resist other media influences such as "models," anti- versus pro-social programming, and the effects of TV advertizing. His prescription for an ideal prevention campaign would combine mass media programming with another major national or regional media event (e.g., the Surgeon General's report), involvement of families, and training of teachers. Further conditions for a successful campaign include the provision for a complete cohort (whole school or whole town) and the addition of a complementary effort such as a smoking cessation program for those already addicted.

Dr. McAlister discussed and categorized general and specific influences on health behavior from the perspective of societal influences, family, peers, school, and individual psychology. A correlational construct is presented relative to beliefs of potential drug users, and the results of research about beliefs are discussed.

Drs. Perry and Jessor approached prevention from the standpoint of four domains of health: physical, psychological, social, and personal. Health promotion in each of these categories may be categorized as focused on either health-enhancing or health-compromising behavior. Finally, the strategies can be focused at the level of the environment, the personality, or the behavior. Thus, a three-dimensional model--a cube--was presented. In the second half of the paper, the youth education component of the Minesota Heart Health Program was described.

Dr. Johnson described several community prevention projects in heart disease (the Multi-Risk Factor Intervention Trial, the Stanford Three Community Study, and the North Karelia Project), evaluated them, and discussed their possible implications for drug abuse prevention programs. Consideration was given to possible design criteria for research in community approaches to drug abuse prevention.

Dr. Botvin stressed the interplay of social, personality, cognitive, attitudinal, behavioral, and developmental factors in drug abuse prevention. He presented his own research which involves a prevention strategy focused on the enhancement of personal competence through basic life skills training and the acquisition of problem-solving skills and resistance skills. He presented preliminary results of an ongoing study which indicate a 50 percent reduction in numbers of new cigarette smokers with this prevention method, the effects being evident up to one year after completion of the program.

Dr. Swisher reviewed the research on alternative programming as a prevention strategy. He cited research to support the hypothesis that some alternatives (academic, sports, and religious activities) minimize drug abuse, whereas some (social, entertainment, and vocational) contribute to the use of various substances. He called for more scientifically planned and evaluated research in this area.

Dr. Brenna Bry reported on her research with school/parent groups and their effectiveness. She found low religiosity, poor school performance, distance from parents, poor self-image, psychological disturbance, and/or drug use before 12 years of age to be predictive of heavy drug use, especially if four or more of these factors were present. She recommended multiple prevention strategies to counter these multiple risk factors. She stated that we need educational approaches using media, social interventions involving the whole environment, modeling the "saying no" approach, encouraging parent influence, family effectiveness and communication training, emphasis on religious training, and, finally, therapy for troubled young people.

Dr. Rokeach addressed the values of drug abusers from the perspective of belief system theory. He indicated that changes in values result in changes in behavior and that humans behave in a manner which reflects their values and self-esteem. Dr. Rokeach reviewed the available research on the values of addicts vs the values of nonaddicts. In general, addicts care more for personal values than for social values, and this appears to be a persuasive difference.

Dr. Pentz evaluated social skills training for adolescents as a possible approach to preventing drug abuse. Training approaches are reviewed and the results indicate that improving social skills reduces substance use and such related behaviors as aggression, withdrawal, truancy, and stealing. Outcome was enhanced by the inclusion of modeling in the training.

Dr. Moskowitz pointed out that there is a long-standing belief that education can solve social problems based on the assumption that knowledge gained will positively affect values and social skills. He discussed the considerable disagreement among experts about the type of education which is most effective or, in fact, about whether the basic assumption is correct.

In a final chapter, Drs. Carl Leukefeld and Joel Moskowitz summarize the discussions which took place at the meeting and the recommendations of the participants for future research efforts.

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The Role of Mass Media in Preventing Adolescent Substance Abuse

**Brian R. Flay, D.Phil.
and Judith L. Sobel, Ph.D.**

Discussion of the role of mass media in drug abuse prevention must reflect, to some extent, the history of drug education in general. Early approaches to drug education were based on moral objections to the use of drugs or alcohol and advocated temperance. We know that such moral approaches to education did not work. Even the outlawing of a substance is not an effective deterrent to its use. A second phase in the history of drug education involved the use of fear approaches. If people could not be exhorted to avoid recreational drugs, perhaps they could be made afraid to do so. Again, we know that such approaches did not work. In fact, the use of fear does not appear to lead to appropriate behavior change unless specific actions are recommended that will overcome or reduce the fear that is aroused (Leventhal 1970). Subsequently, drug educators came to believe that an appropriate message was one that emphasized the objective facts about the physical properties of drugs, and the consequences (usually long-term health consequences) of using them. These programs did not work well either (Goodstadt 1976). In fact, sometimes they even led to "boomerang" effects (Swisher et al. 1971), possibly because the information provided served only to increase adolescents' curiosity about the substances described, or possibly because adolescents may have, as a result of the viewing environment, become aware of perceived group norms, and shifted attitudes accordingly (Feingold and Knapp 1977).

We have elsewhere (Flay et al. 1980; Flay 1981) provided a social-psychological analysis of why information-based programs do not work well. Basically, it is because changes in knowledge, which such programs sometimes do accomplish well, are only at the beginning of a long probabilistic chain, and many other factors must be examined if behavior is to be changed. One of these other factors concerns values -- and values clarification and decisionmaking approaches dominated the fourth phase in the history of drug education. The majority of attempts using these so-called "affective" approaches were also unsuccessful, probably because they also failed to address many of the major determinants of adolescent drug use.

In recent years, there has been increasing recognition that the primary influences on adolescent drug use are social, particularly peer and family influences. Recent prevention programs that make students aware of social influences and provide them with the social skills with which to resist or cope with such influences have been more successful (see other chapters in this collection). Although the mass media are also thought to be a source of social influence on adolescent drug use, direct effects have been much more difficult to document. In this paper, we will a) discuss briefly the pervasiveness of media influences to use drugs, b) review past attempts to utilize mass media for drug education, c) provide an analysis of mediators of successful and unsuccessful uses of the mass media, d) argue that the principles found to be effective in classroom programming can and need to utilize mass media to be disseminated widely and, therefore, to have maximum effects, e) describe an example where this was done, and f) close with some research recommendations. We argue that despite the many past failures in the use of mass media for drug abuse prevention, the recent successes of classroom-based drug abuse prevention programming, coupled with communication research principles and our recent success at using mass media for cigarette smoking prevention, give us confidence that mass media have a valuable role to play in solving the very important problem of increasing adolescent drug abuse.

IMPORTANCE OF MEDIA

Television is the preeminent mass medium among adolescents. The typical American child will spend more time watching television than he or she will spend at any other single activity, including going to school or interacting with friends. All this time spent watching television undoubtedly provides adolescents with many learning opportunities. Much research suggests that behavioral learning does occur during viewing (Pearl et al. 1982; Roberts 1983).

Content

Adolescents observe and listen to drug use, particularly alcohol drinking, being modelled and discussed as a natural and everyday event on prime-time television. Reviews by Barcus and Janowski (1975) and Winick and Winick (1976) document the pervasiveness of drug content in all forms of entertainment media, including television, radio, magazines, and records, particularly those preferred by adolescents. Alcohol is the most frequently depicted drink in television programming, and it is usually depicted as a "social" drug with generally positive consequences resulting from its use (McEwen and Hanneman 1974).

Among the illicit drugs, it has been suggested that marijuana use, while rarely depicted, has become a trivial matter and is commonly regarded with humor as a harmless escape. Other illicit drugs are rarely shown and fairly consistently associated with bad consequences (McEwen and Hanneman 1974).

Very few depictions of cigarette smoking appear on television as compared with character counterparts of the 60's and early 70's. In fact, a similar change may be just beginning with respect to alcohol use. Negative consequences and dependence associated with use are more prevalent than they were even a few years ago. As a result of some academic and other interest groups, several prime-time shows have even incorporated episodes dealing with the problems of drinking (e.g., "MASH," "All in the Family") and drugs (e.g., "Different Strokes," "Quincy").

Advertising of cigarettes, alcohol, and proprietary drugs may be responsible for more adolescent exposure to drug use than all the entertainment and news programming combined. With the exception of cigarette ads on television, alcohol, tobacco and proprietary drug advertisements are pervasive throughout the mass media. The predominant message of advertisements is that use of recreational drugs, or frequent use of proprietary drugs, is not only acceptable, but is even desirable (Milavsky et al. 1975).

Recently, a new concern in mediated exposure to drug use has been directed to the possible effects of approaches to drug coverage on TV news. Drug problems (busts) are popular human interest stories. Scripts for these segments are written quickly with little thought to their effect on adolescents. It has been suggested that more care be taken with these reports: to dramatize the drugs less and report actual legal consequences.

Overall, when we add up these various influences, we find the mass media environment to contain many pro-drug-use messages. The anti-drug or prevention-oriented content of mass media appears to be minute compared to the pro-drug-use content noted above. The number of prevention-oriented PSA's,* for example, is outnumbered many times by the number of pro-drug commercial advertisements. The number of prevention-oriented portrayals in entertainment programming is also small compared to pro-drug, especially pro-alcohol, portrayals. There may, however, be a real effort being made by society (e.g., Breed and Defoe's 1981, alcohol interest group) to change the nature and extent of drug usage in the media. The decrease in characters smoking cigarettes is clear, and alcohol appears to be next. It also seems that there are increasing attempts to provide more anti-drug messages within entertainment programming. However, while no detailed analysis is yet available, these do seem to rely fairly heavily on the information (objective facts) and fear approaches -- and so will probably not be very effective as preventive influences.

Effects

Studies have found that non-users of drugs identify the mass media as one of their most important sources of information about drugs (Hanneman 1973). Further, two studies found that mass media was designated as an important place for adolescents to learn about drugs, and was perceived by them as a trusted and influential source of information, irrespective of individual drug use (Fejer and Smart 1971; Sheppard 1980). Yet, while there is increasing evidence that anti- and pro-social behaviors are learned, at least in small part, from seeing them modelled on television (Pearl et al. 1982), relatively little research has been done on the effects of viewing, reading, or hearing drug use messages. This is surprising in that a) drug use/abuse is of major concern to parents and schools, and b) there is a significant amount of social modelling of drug use on television.

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* public service announcements

Research on the behavioral influence of ads on adolescents is also limited, but some studies suggest that over time proprietary drug ads do affect proprietary drug use, at least when adolescents are also exposed to those drugs at home (Milavsky et al. 1975). Rossiter and Robertson (1980) found that adolescents exposed to proprietary drug ads had generally more favorable though still moderate dispositions toward products than those not exposed. As a result of similar research, Atkins (1978) suggested that "children's beliefs about the efficacy of medicine and illness in society were affected by (exposure to) drug advertising" (p. 76). Proprietary drug exposure has not been shown to affect illicit drug use among adolescents (Milavsky et al. 1975). There is, of course, evidence that commercials aimed at children affect children (Roberts 1983). Adolescents are more likely to want to have the attractive products they see advertised, and this increases sales (Atkins 1982).

While no causal relationship has been established between viewing drug use on television and subsequent drug use by adolescents, four considerations make such a relationship highly likely. The four considerations are: a) learning theory principles (which have been empirically validated in other behavioral domains), b) documented effects of anti- and pro-social programming on children's behaviors, c) documented effects of advertising on children's consumer behavior, and d) the finding that adolescents not yet using drugs seek information on them from mass media.

Conclusions

Our current understanding of the determinants of drug use has led to prevention programming that a) provides ways of resisting social influences, and b) makes positive use of those influences. Similarly, our belief that mass media can influence adolescent drug use leads us to suggest that prevention programming should a) provide ways of resisting media influences, and b) make positive use of mass media for prevention. There is some progress in both directions -- the former is reviewed briefly immediately below, and the latter is reviewed in more detail in the next major section.

Some progress has already been made in teaching adolescents how to resist media influences. Some studies have shown that adolescents can be taught to recognize and develop counterarguments against false claims of advertisements (Goldberg et al. 1979; Ward et al. 1977). This approach has already been used in most social-psychologically derived smoking prevention programming.

There is growing and consistent evidence that shared viewing and directed interaction with adolescents about what they view can affect the influence of a program dramatically. Verbal labelling and role-playing have both been used successfully in studies of mediated behavioral learning. This technique can be used either to enhance the effects of a program or to counteract the effects of viewing antisocial behaviors (Friedrick and Stein 1975). It has been suggested that parents and teachers must be aware of the media environment and effectively "counter-educate" adolescent viewers by offering superior alternatives. There is even evidence that the real-life meaning derived from television by children can be tempered by teaching them about the production process and by teaching them a healthy skeptism (Singer et al. 1980).

USE OF MASS MEDIA FOR PREVENTION

Health Promotion In General

In making the transition from assessing the influence of "natural" media such as entertainment, advertising, and news, to an examination of the effects of media campaigns, one is struck with the very poor record of evaluated mass media health promotion programs. It seems somewhat paradoxical that when we are not trying to affect behavior some behavior change has been observed, but when a concerted effort is made to affect behavior, significant change often fails to occur. The preponderance of failed campaigns must, however, be placed in historical perspective. Greater success has been achieved by some more recent programming.

The history of the use of mass media for pro-social objectives in general, and health promotion in particular, closely parallels the history of drug education research (see Blane 1976 and Wallack 1980 for more detailed surveys). Early campaigns were based on providing information or avoiding fear. They were often successful at changing knowledge, less often successful at changing attitudes, and rarely successful at influencing behavior change (Atkin 1979; Cartwright 1949; Flay 1981; Flay et al. 1980).

Over 30 years ago Cartwright (1949) outlined three stages that a campaign must go through to influence behavior: i) create an appropriate cognitive structure (i.e., what people know and understand), ii) create an appropriate motivational structure (i.e., what people want to do), and iii) create an appropriate action structure (i.e., what people actually do and how this can be facilitated). Our more complex model that incorporates theories from many different areas of psychology is based on that same underlying structure (Flay 1981). It is noteworthy that the histories of both drug education and the use of mass media follow these steps -- from providing facts, to arousing fear, to altering action structures -- with the latter occurring only very recently. It is also clear that the most successful mass media health promotion programs have included the development of action structures. We shall see below that this is also true in the use of mass media for drug abuse prevention.

In addition to message structure, other factors that have been emphasized by reviewers of the use of mass media for health promotion include, but are not limited to (e.g., Atkin 1979; Blane and Hewitt 1977; Flay et al. 1980; Griffiths and Knutson 1960; Mendelsohn 1968, 1973; Solomon 1982; Wallack 1981): a) the need for more careful planning of media products, and for more formative evaluation during product development; b) program or campaign dissemination issues -- no effects can be expected if the audience is not reached, yet many PSA campaigns fail to do so; c) the use of multiple channels, including supplementation of media programming with other campaign activities; d) audience selectivity (Klapper 1960; Sears and Freedman 1967) and interpersonal communication (Katz and Lazarsfeld 1955) as mediators of media effects; and e) the need for more frequent and improved summative evaluation (Ball 1976; Flay et al. 1980; Flay and Cook 1981; Haskins 1970; Towers et al. 1962; Wild 1975). Again we will see that these same issues arise with respect to mass media drug abuse prevention programming.

Most studies of the use of mass media for drug abuse prevention concern drug and/or alcohol PSAs. These will be reviewed immediately below. In a subsequent sub-section, we will review a few studies that involved more than PSAs, such as testing the effectiveness of 90-minute shows, comparing media-only and media plus community mobilization interventions, and investigating the role of interpersonal communication in mediating the effects of films on PSAs.

Studies Of Drug And Alcohol PSAs

In a study of drug information sources among college students, Hanneman (1973) found trustworthy, personal informants to be more important sources of drug information than media, among users. Media were found to be one of the most important sources among non-users. In an attempt to at least partially explain this finding, the author analyzed the content of drug information television programming. Out of 500 hours of viewing analyzed, 37 minutes were devoted to PSAs about drug abuse, 80% contained no factual information, and most were nonspecific and broadcast during the least popular viewing periods. Hanneman suggested that the PSAs were minimally effective on a high risk audience not only because of PSA content and timing problems, but also because drug abuse education is an information-sharing process, subject to the information flow between opinion leaders and followers.

Two weeks of drug abuse appeals on television were content analyzed by Hanneman (1973). Of 85 appeals observed, only 18% were youth-oriented. Almost half were broadcast between the hours of 10:00 a.m. and 3:00 p.m. Another one-third were broadcast before 10:00 a.m. and after 10:30 p.m. No appeals were broadcast between 7:00 p.m. and 10:30 p.m. Twenty-two percent of the messages relied heavily on a presentation of the harmful social effects of drug use and 20% showed a heavy reliance on the presentation of the harmful physical effects. A total of 40% used fear as the motivation for the prescribed behavior change, and it was concluded that most were neither directed toward, nor specific to, the needs of any one subpopulation.

Capalaces and Starr (1973) reviewed anti-drug abuse PSAs over the five-year period preceding 1973. They found that PSAs relied heavily on creating anxiety and fear in the audience. They suggested that the PSAs were ineffective because a) scare tactics were used which were not "concordant with subjective reality" (e.g., all adolescents who take drugs don't overdose as some PSAs implied), b) target audiences were rarely identified, c) station managers (gatekeepers) were not well informed and, therefore, allotted haphazard energy and effort to scheduling, and d) appropriate audiences were not "reached."

Goldstein (1974) content analyzed published and unpublished research papers in the fields of broadcast-mediated drug education between 1968 and 1972. The author concluded, based on the quantitative review, that television is the most effective medium with which to promote drug abuse prevention. Further, the message was most effective if the source had credibility, was knowledgeable and was someone with whom the audience could identify. The most effective content was educationally oriented material (based on scientific fact) with minimal reference to fearful consequences, but provoking some discomfort and stating clear cut suggestions for alternative behaviors.

Hanneman and McEwen (1973) reported that during NIAAA's 1972 campaign, many of the youth-oriented PSAs were aired during day-time hours when most youth would be in school. About 2% of those recalling any exposure wrote to the advertised address for further information. Drinkers were more likely to recall one or more messages (approximately 60%) than non-drinkers (approximately 40%). A central finding was that the "market" is heavily segmented, with different messages appealing to different segments.

Harris and Associates (1974) evaluated a NIAAA alcohol prevention PSA campaign to assess the penetration and recall of the campaign, attitudes toward PSAs, and beliefs about trends regarding the nature and extent of alcohol abuse. Sixty-four percent of those surveyed recalled seeing at least one advertisement while only 22% recalled seeing four or more. Older and less educated subjects recalled fewer messages. Heavy drinkers were less likely to remember seeing ads than light drinkers, and the ads most commonly recalled were those involving drinking and driving.

Rappaport et al. (1975) tested the public's perceptions of 12 ads used in the NIAAA PSA campaign of the early seventies. While 60-70% of respondents recalled seeing PSAs "in the past few months," a maximum of 39% recalled one theme ("don't drink and drive"), less than 12% recalled any one other theme, and about 40% of respondents did not recognize any of the NIAAA messages.

The Public Sector Research Group (1978) evaluated the 1978 national prevention campaign sponsored by NIDA. While there was some evidence that beliefs about the nature of drug abuse were changed, there was no evidence that the campaign increased participation in prevention activities or feelings of efficacy and personal responsibility about prevention.

Plant et al. (1979) evaluated a media campaign, begun in 1976 in Scotland, that utilized television and newspaper ads in an attempt to encourage individuals who abuse alcohol to seek help. A complex evaluation design was used to assess the effect of the campaign on knowledge about alcoholism, knowledge of services available, use of treatment agencies, and individual alcohol consumption. Surveys were conducted by household and through national and local newspapers. No exposure (the control), two-month, six-month, and eight-month exposure periods determined the intervals between surveys. In addition, contacts with agencies about ads and letters received in response to the campaign were reported. The exposure group was significantly better able to recall the messages than the no-exposure group. After two months of exposure there was a small significant difference between the treatment and control groups in their belief that problem drinkers could be helped. The older (over 45) respondents recalled more information about alcoholism in the exposure group than the control. No difference was found in the number of agencies contacted by each group.

After eight months of exposure, respondents were significantly more likely to recall seeing the films and to recall specific contents of the messages than the six-month exposure group. In both groups, respondents were better able to name agencies and believe problem drinkers could be helped than those not seeing the messages. Older respondents (over 45) felt they could advise persons with alcohol problems better if they had seen the message than if they had not. Television segments reached more individuals than the newspaper ads. The authors concluded that penetration was reached, and knowledge was realized, after months of exposure for older audience members. The young were unaffected by this campaign. Viewers were about 10 percent better informed about alcohol, and there appeared to be an increase in referrals in several agencies in the target communities.

Field et al. (1983) report an evaluation of the implementation of the NIAAA 1982 Alcohol Abuse Prevention Campaign. This campaign consisted of 12 PSAs targeted at women and youth, with special attention to Fetal Alcohol Syndrome and drinking and driving among youth. Several of the spots emphasized the negative social consequences of drinking to excess, and others modelled socially acceptable ways of resisting offers or social pressures to drink.

PSAs could have reached 85% of TV households an average of 45 times per day (across all stations). However, only 6% of these airings were during prime time (8:00 p.m. - 11:00 p.m.) and only 20% between 5:00 p.m. and 11:30 p.m. Even these lead to overestimates of likely viewership, in that only local stations aired 20% between 5:00 p.m. and 11:30 p.m.; the networks aired only 3% during this time period. Thus, local stations aired more PSAs during prime time, but national networks tended to have most of the audience during those hours. These data point up rather dramatically the low coverage obtained by PSA campaigns in the United States.

Primary findings from the Field et al. (1983) evaluation concern program dissemination. Effective dissemination was associated with:

a) well-planned and carefully executed approaches to media gatekeepers (public service directors at each station); and

b) extensive community involvement -- which involved volunteers, State authorities, the private sector, schools, political and government leaders, experts/celebrities, and other media.

One of the few evaluations of the cost-effectiveness of a campaign was conducted by Hu and Mitchell (1981) on data from an outcome evaluation of the 1978 NIDA drug abuse prevention media campaign intervention (Public Sector Research Group 1978). Data were assessed on intervention costs, PSA play-time, and subsequent audience effects at eight treatment and two control sites. The average cost of a PSA spot was determined to be $92. It was estimated that 10.4% of respondents between 12 and 65 years of age, who had viewed a PSA, could recall it when surveyed. The cost was estimated at 11¢ per viewer. Two models were tested in regression analyses involving socio-demographic variables, time spent watching television, site, concern about the issue, number of PSAs played, number of PSAs remembered, and involvement in prevention activities. Model I proposed that the ability to recall the PSA was a function of socio-demographics, the amount of television viewed, and the number of PSA spots. Model II proposed that concern about, and involvement with, the prevention of drug abuse was a function of demographics, location, and recall. Results of model I analyses indicated a greater likelihood of being able to recall the PSA when more PSAs were played, when more television was viewed, when the respondent was from a lower educational background, and when the respondent was neither black nor white. Model II analyses indicated that concern about alcohol abuse was likely to be greater if the respondent was older, less educated, female, black, unemployed, or residing in a few specific cities around the country. In addition, a respondent who remembered the PSA was most likely to be highly concerned. Involvement in drug abuse prevention was greatest among younger, highly educated, and black respondents. Ability to recall the PSA was also positively associated with level of involvement.

In one of the few reported attempts to experimentally evaluate the effectiveness of a PSA campaign, Morrison et al. (1976) used a non-equivalent control group design with program and control cities to study the effects of radio and TV alcohol and drug abuse PSAs. There were no differences between cities in the proportion of people who had heard an alcohol or drug abuse commercial, partly because other organizations were airing such PSAs at the same time in both cities. Furthermore, however, there were no differences in knowledge or attitudes between those who had heard a commercial and those who had not.

In another quasi-experimental investigation of the effectiveness of a PSA campaign, Delaney (1978, 1981) evaluated a two-year radio, television and newspaper campaign in Florida that attempted to increase public awareness about the effects of alcohol abuse. Three counties constituted the treatment communities and three other counties acted as matched controls. Stratified sampling using phone survey methods before and at the end of one year revealed a 13% decrease in the mythical belief that a drunk person will become sober with cold showers and hot coffee compared to a 3% change in the control communities.

Anti-drug campaigns have sometimes had "boomerang" effects. For example, the anti-chewing tobacco campaign of the early 1900's seems to have contributed to an increase in cigarette smoking; anti-barbiturate publicity in the 1940's was followed by more wide-spread use; anti-speed campaigns of the early 1960's may have alerted a new generation of young people to its pleasures and perils; anti-marijuana, anti-LSD and anti-glue sniffing campaigns were followed by increases in the uses of these substances (Brecher 1972). Media sensationalism and scare tactics can glamorize some risky behaviors and lead to increased experimentation among young people (Kinder 1975).

Studies Involving More Than PSA Campaigns

In this section we review laboratory-style investigations of anti-drug message characteristics, an evaluation of the effects of a full-length film treatment of drug issues, studies of the value of purchasing or legally mandating counteradvertising, and two examinations of the role of interpersonal communication.

Three studies provide examples of laboratory-style investigations of anti-drug message characteristics. Smart and Fejer (1974) studied the effects of high and low fear appeals about drug abuse. With an interesting twist, the first study consisted of presenting one in a series of messages incorporating various levels of threat to randomly assigned 9th, 11th and 13th grade classes. From questionnaire data regarding drug use, attitudes, and intentions, no association was found between intentions and anxiety levels. In the second study, the authors examined the same variables after students viewed one in a series of presentations about an unknown (fictitious) drug called M.O.T. It was suggested that few extraneous influences would affect attitudes about this drug. The effects of levels of fear in the presentation were very significant. High fear appeals were far superior to low fear appeals. It was suggested that in the case of a new drug high levels of fear will discourage use. Those students who received the high threat appeal were less likely to want to try the drug and more likely to believe that possession should be illegal.

Feingold and Knapp (1977) randomly assigned 10 high school English classes to one in a series of 60-second anti-drug commercial presentations in which three variables were manipulated: a) the threat of serious versus minimal harm, b) the use of explicit versus implicit conclusions, and c) presentation in monologue or dialogue format. Twenty-five Likert Scales were used to ascertain attitudes about the specific drugs discussed pre- and post-viewing. Results across groups showed that threat of serious harm was no more effective than that of minimal harm. However, the explicit conclusion was more effective than the implicit conclusion, and dialogue was found to be significantly more effective than monologue format. Results from within-group comparisons showed a significant shift in attitudes in the direction opposite to the intent of the message.

In an elaborate three-study design, Ray and Ward (1976) extensively pretested three anti-drug programs on specific populations under specific conditions to determine their acceptability and overall effectiveness. The design included tightly controlled laboratory settings as well as more naturalistic field settings. Eighty treatment conditions were identified after manipulating environmental, socio-demographic, and program format variables. Self-administered questionnaires given pre- and post-presentation to Juniors, Seniors, and parents in the first study, and to adults in the second and third studies, provided data on recall of information, attitudes about drugs, and interest in the presentation. Responses elicited during the presentations in the first and second study also provided data on the extent and nature of cognitive responses. The authors conclude that when pretesting material, researchers must evaluate more than just attitudes about the program issues or program format; they must assess all manner of environmental and situational conditions in which the program will be viewed, as well as the specific responses which those conditions elicit, in order to fully assess the effectiveness of the program in question.

Only one study has examined the effects of publicly broadcast, full-length, anti-alcohol programming. Dickman and Keil (1977) studied the effects of weekly 90-minute PBS programs on alcoholism. Using a random sample of 1200 people in Pennsylvania, they found a) very low exposure (2.3% of the sample) to the programs, as would be expected given their placement on PBS, b) many more people with an alcohol problem were familiar with the program, and c) less than one quarter of those with a problem who were familiar with the program said the program had stimulated them to take some corrective action.

In an attempt to overcome a major problem with PSAs (that is, reaching the audience), several studies report evaluation of purchased counteradvertising. For example, Goodstadt (1977) reported on an evaluation of a paid public alcohol information campaign in Ontario, Canada. The campaign was successful in reaching its audience, but the majority of those surveyed were unable to recall any content of the messages.

The California Medicine Show (Hanneman et al. 1977, 1978), a project designed to alter behavior regarding prescription and over-the-counter drugs, was tested using three test sites. One site was subjected to a purchased and public service advertising campaign plus community mobilization techniques. One site received the total media campaign without community mobilization, and one site received only the public service announcements. Six-month data indicated that behavioral change occurred at the sites where media saturation was utilized. Results of another California campaign that used purchased time in an effort to alter drinking behavior were not as encouraging (Wallack 1978, 1979).

One way to ensure that PSAs reach their intended audience is to have them legally mandated. O'Keefe (1971) studied the effects of the radio and TV anti-smoking counter-advertising of the late 1960's. During the time of the study, between 80 and 100 anti-smoking ads appeared on television each week. Among samples of students and adults in Florida, almost 90% reported seeing at least one commercial, and 50% could remember the message of at least one commercial. Nonsmokers and smokers already predisposed to quit smoking perceived the counterads to be much more effective than did confirmed smokers. No influence on behavior was detected, although later analyses of cigarette sales suggest strongly that, over the long term at least, counteradvertising did reduce cigarette consumption (Hamilton 1977; Warner 1977, 1980; Warner and Murt 1982).

Interpersonal communication is thought to be important to a) diffuse messages (Katz and Lazarsfeld 1955; Katz 1980) and b) increase their saliency to the exposed audience (McCombs and Shaw 1972). Two studies of mass media drug messages address this issue.

Trager (1976) tested the effects of four drug education (heroin) films on adolescents' subsequent discussions with their familles or peers. He found that 10% of exposed adolescents, as compared to only 5% of a control (unexposed) group, reported discussing any of the films with their parents, with females three times more likely to (15%) than males (5%), and with such interaction more likely to occur in "pluralistic" or "laissez-faire" homes (16% and 18.5% respectively) than "protective" or "consensual" homes (4% and 4.5% respectively). Students were almost four times as likely to discuss the films with their peers (38%), with females again more likely to do so (52%) than males (25%).

Wong and Barbatsis (1978) tested the level of knowledge and attitude change caused by educational television drug information programs and group discussion. Viewers self-selected themselves to study in groups or alone. While the program produced significant knowledge and attitude change, no significant differences were observed for the group versus alone comparison. These negative results could, however, have been due to self-selection -- with those individuals judging that they would do better in a group choosing to join one and others choosing not to.

Conclusions

Any conclusions about the effectiveness of past drug abuse prevention programming must be prefaced by some remarks regarding the quality of the reported evaluations. Most consist of simple cross-sectional surveys, that is, a single-group, post-test-only design (c.f. Campbell and Stanley 1966; Cook and Campbell 1979). Accordingly, results must be interpreted with great caution. Results from the two controlled studies demonstrate the importance of control groups. For example, one of the treatment and comparison group studies (Morrison et al. 1976) was seriously flawed in that the comparison community seemed to have received as many messages as the treatment community. This might not have been determined without a control group. Studies involving more than PSAs are too few, and also of too problematic quality, to allow any firm conclusions to be drawn on the basis of this review alone.

Despite the above shortcomings, however, this review, together with theory and reviews of mass media effects in other domains, does allow us to reach some conclusions. The first major conclusion, of course, is that more and better research is required, but we will leave a detailed discussion of that issue until later in the paper.

An overwhelming majority of mass media drug abuse prevention programs have failed to change behavior. One obvious major reason for this is that most PSA campaigns literally fail to even reach the audience. Obviously, a campaign cannot affect peoples' behavior if it doesn't even reach them. Advertisers believe that it requires an average of three exposures for an advertisement to affect purchase behavior (Hersey et al. 1982). It probably takes even greater exposure to influence health behavior. Yet most evaluations report the proportion of a surveyed sample who recall seeing any ads. Even those studies of purchased counteradvertising drug and alcohol campaigns (Goodstadt 1977; Hanneman 1977, 1978; Wallack 1978, 1979) did not report the proportion of their audience reached by their ads three or more times. Given the low budgets compared to alcohol and cigarette advertisers, the mediocre effects of these paid counteradvertising campaigns might still be explained by low exposure. The one counteradvertising campaign that has been found to be effective was, of course, the anti-smoking campaign of the late 1960's. That involved one counterad for every three to five cigarette ads and definitely reached a large portion of the target audience.

Another major reason for the failure of most PSA campaigns has probably been heavy reliance on information and fear messages. We need not dwell again on the reasons for the ineffectiveness of information-oriented programs at changing behavior. Regarding fear-based messages, teenagers are particularly likely to counterargue against threatening messages (Atkin 1979).

Another problem with anti-drug-abuse campaigns was the tendency for PSAs to be directed to unidentifiable audience segments (Capalaces and Starr 1973; Hanneman et al. 1973; Rappaport et al. 1975).

Adolescents are clearly an easily defined segment that can be reached with relevant messages.

The studies on the role of interpersonal communication do not suggest any firm conclusions. Indeed, the lack of studies in this area suggests a focus for future research.

MACRO-LEVEL MEDIATORS OF SUCCESS AND FAILURE

We have seen that attempts to use mass media for health promotion in general and drug abuse prevention in particular have often failed and only occasionally succeeded. In previous papers (Flay et al. 1980; Flay 1981) we have focused on traditional, micro-level, source, message, and channel characteristics of media products that are related to success and failure. Utilizing social psychological theories, we developed an integrative model of the attitude and behavior change process, and identified a large number of ways in which media messages could be improved to increase attitude and behavior change. There seems to be some evidence in our review that at least some of the most recent messages are incorporating more of those suggestions. For example, the most recent NIAAA and NBC[1] campaigns included modelled ways of saying no to social pressures to drink or do drugs. There is certainly ample evidence, reviewed by others in this volume, that we now know a good deal about how to design classroom programs that incorporate our suggestions for successful behavior change and that successfully prevent at least cigarette smoking and probably also more general drug abuse. The few successful media campaigns have demonstrated that those principles found successful in the classroom also can be incorporated into media campaigns. However, even with the best-designed media messages, there remain three major factors that limit the success of a mass media campaign. The remainder of this paper will focus on these.

Program Dissemination

Many past campaigns, particularly PSA campaigns, probably have failed precisely because they were not well disseminated. Airing of PSAs outside of prime time and/or on non-commercial stations, and then only infrequently, cannot lead to the levels of reach and frequency necessary to ensure adequate exposure.

The best example of a successful PSA campaign was the corrective advertising against cigarette smoking. That campaign consisted of spots on prime time, one for every three to five cigarette ads, for an extended period of time (several years), with many different spots being produced and used (thus ensuring some novelty). Several analyses demonstrate that such an approach was effective at reducing the level of cigarette smoking while it was in effect, though this effect may have been reduced once all advertising was removed from television (Hamilton 1977; Warner 1977, 1980; Warner and Murt 1982).

All other effective mass media programs also had demonstrably high levels of exposure because of good dissemination. For example, the CBS Driver's Test (Bush 1965; Mendelsohn 1973) was shown nation-wide on a national network during prime time. The Stanford Heart Disease Prevention Project involved the use of multiple media over an extended period of time, as did the Finland study. Pechacek et al. (1983) recently ensured high exposure for a smoking cessation program by promoting it through existing community organization channels set up for the larger Minnesota Heart Health Project.

Obviously, there must be successful dissemination of a program before any intended effects can be expected. Primary mediators of successful program dissemination are media "gatekeepers." Television and radio station managers, and newspaper and magazine editors, are the most obvious and most proximal examples of gatekeepers. Politicians, trade union representatives, Parent-Teacher Associations, consumer protection groups, etc., are less obvious and more distal, but equally powerful gatekeepers. Media gatekeepers determine, to a large extent, what is and is not acceptable for media presentation. As such, they are the first that must be convinced of the worth of a media product or campaign if it is ever to be disseminated adequately.

We need not be pessimistic about the attitude of media gatekeepers toward drug abuse prevention material. First, at least some gatekeepers in the broadcast industry have already discovered that certain treatments of health issues in general, and the drug problem in particular, are not only acceptable to audiences, but may be desired. KABC-TV in Los Angeles believes strongly that Dr. Art Ulene's health program, "Feeling Fine," helps their ratings, and his treatment of smoking and drug problems provide no exception. Cable Health Network seems to be signing up cable distributors and advertisers at a rate better than anybody ever expected. NBC's use of the First Lady to inject a drug education message into a prime time entertainment program obviously would not have been done if it was thought to jeopardize ratings. NBC's recent "Don't Be A Dope" program provides another demonstration of media commitment to solving the drug problem. This program obviously overcame program dissemination problems because it was initiated by the media gatekeepers themselves. Thus, they aired PSAs during prime time, they advertised in local newspapers, they showed some of their programming (five 5-minute segments) during the early evening news hour and aired a 30-minute program ("The Drug Abuse Test") during prime time (7:30 p.m.).

Selectivity

Klapper (1960) and Katz (1980), among others, have suggested that a second major mediator of media effects concerns individual selectivity; that is, individual predispositions to attend or not attend to messages on particular issues. While it has been difficult for social psychologists to demonstrate this phenomenon in laboratory studies (Sears and Freedman 1967), it is readily observable in more sociologically oriented field studies (Atkin 1973; Katz 1968). It is known, for example, that women are, on the average, more likely to attend to health information (Feldman 1966). Drinkers are more likely to attend to and recall drinking-related messages than are nondrinkers (Dickman and Keil 1977; Rappaport et al. 1975). Several studies have demonstrated that heavy smokers are less likely to attend to information about the health consequences of smoking, and more likely to develop counterarguments to such information, than light smokers or non-smokers (O'Keefe 1971). Uses and gratifications research seems to provide the best explanation of this phenomenon (Blumler and Katz 1974) -- with considerable buttressing from value and value-expectancy theories of psychology (Palmgreen and Rayburn 1982). In essence, these theories, and the research data underlying them, suggest that individuals are more likely to attend to a program or campaign if it meets a salient need or value that they have. For example, a drug education program can be successful at gaining and holding the attention and involvement of adolescents if they can see that it might help them become more socially adept or improve their self-esteem or independence from adults in some other way.

Problems of selectivity are probably minimized when there is a focus on prevention rather than cessation. Users of drugs are less likely to attend to a program that tells them why they should stop or how to stop using drugs than non-users of drugs are to attend to a program that provides them with the skills necessary to remain non-users. Parents, even smoking and drug-using parents, are perhaps even more likely than children to attend, and to try to get their children to attend, to a prevention-oriented program than a cure or cessation program. Thus, one of the major ways of increasing interpersonal communication, working with families, probably also decreases selectivity. In addition, reduced selectivity and therefore increased attention would also lead to increased agenda setting.

Focus on selectivity as a problem might also lead health educators to pay more attention to the needs of their potential audience. This problem has been minimized somewhat for drug educators because they believed that they had a captive audience in school students. Distributing drug prevention programs to a non-captive audience will demand that greater attention be given to audience needs and values. Fortunately, analyses of media content suggest that there is already an accelerating move toward prevention of drug use or abuse, and a corresponding demand for such programming by viewers, particularly parents. Adolescents' needs will still need to be considered carefully, however, and drug prevention programming promoted as social skills development and health promotion rather than as drug prevention.

The problem of selectivity is of particular concern for media-based drug prevention programming. The crucial question is, "How do you get high-risk adolescents to attend to and participate in drug abuse prevention programming?" Adolescents at high risk of becoming drug users are those who a) have drug-using parents, b) have drug-using friends, c) have low opinions of themselves (i.e., low self-esteem, poor performance in school), and/or d) are generally rebellious against parental/adult authority. Under what conditions are such adolescents likely to view media programs on drug abuse prevention? Not many, but a few do come to mind. Favorite music groups advocating non-drug use might sway even those adolescents whose friends are users -- and may even influence some of their friends to quit. Admired stars or sports heroes may also be effective. We believe, however, that media programs alone may never be as effective as those that include complementary elements such as school-based curricula or community organization designed to increase interpersonal communication. Such combinations of program elements stand a greater chance of reaching high risk adolescents than those that rely on media alone. In addition, such programs increase the speed of agenda setting and diffusion and ultimately the adoption of new norms.

Interpersonal Communication

Cartwright (1949) and Katz (1980; Katz and Lazarsfeld 1955) have also identified level and direction of interpersonal communication among the target audience as being major mediators of mass media program effectiveness. Early social psychological and communications research studies support the notion that interpersonal communication, particularly group discussion, increases the effectiveness of media messages (Lewin 1947, 1965). Johnson (1983; Johnson and Ettema, in press) provides a more recent and children-based example. Children who viewed and discussed a TV series in the classroom evidenced more changes than children who did not have the opportunity of discussion after viewing the same TV series in the classroom. The diffusion of messages or adoption of innovations (Rogers and Shoemaker 1971) also relies on interpersonal networks.

To the extent that an issue is already salient, people will be discussing it with each other, and any new information or program is likely to be attended to and also discussed. To the extent that an issue is not already salient, the ultimate effectiveness of a mass media program will be enhanced if it gets people talking to each other about the issue (i.e., agenda setting -- McCombs and Shaw 1972). Interpersonal communication then spreads the message, or reactions to it, to a wider audience. Diffusion of an issue may lead, in turn, to demands for more information on it or for new policies or laws.

The issue of drug use seems to be fairly salient these days, with pro and con points of view receiving treatment by the media. The existence of both points of view on the media should, in turn, lead to increased interpersonal communication about the issue. Trager (1976), for example, found that viewing drug education films encouraged a small amount of discussion with peers and parents.

Many of the most successful campaigns and programs of the past have included conditions that increased the probability of interpersonal communication. For example, the TV-based smoking cessation programs of Best (1980) and Danaher et al. (1982) explicitly instruct participants to obtain the support of their spouse or a friend. The face-to-face condition of the Stanford Heart Disease Prevention Project (Maccoby and Farquhar 1975) naturally involved interpersonal communication. In addition to increasing diffusion and the possibility of attitude and behavior change, interpersonal communication is probably also important for ensuring the maintenance or persistence of induced changes (Cook and Flay 1978).

Cost-benefit issues become important when face-to-face programming is recommended to ensure or enhance the effectiveness of mass media programming. One of the great arguments for using mass media is its potential cost-effectiveness , its ability to reach many people at a relatively low cost per person reached. Adding face-to-face elements is likely to increase unit costs. However, judicious selection of methods of increasing interpersonal communication can keep costs down and does not necessarily reduce cost-benefit ratios. Intensive clinics, such as the smoking or weight loss clinics offered to high risk individuals in one condition of the Stanford Three Community Study, are very expensive. Use of school-based curricula that encourage family interactions may still be as much as double the cost of television programming alone. However, this is much less expensive per unit than face-to-face clinics, particularly as schools want to, or are mandated to, offer drug education anyway. Some forms of community organization, particularly those that make heavy use of existing organizations, many of which may be voluntary, might also be cost-effective alternatives.

Agenda setting and diffusion of new ideas each serve to increase interpersonal communication still further, which, in turn, is likely to influence media gatekeepers. Thus, interpersonal communication is seen to be important not only in mediating media influence on individuals, but also on the media's acceptance of issues for further exposure.

An Example Of A Program That Overcame The Above Problems

In this section, we describe an example of an evaluated smoking prevention program that incorporates many of the suggestions made above for improving program dissemination, selectivity, and interpersonal communication (more details on this study can be found in Flay et al. in press).

Targeted primarily at junior high school students and their families, the USC/KABC-TV Smoking Prevention and Cessation Program consisted of the following elements:

1) Five 5-minute TV segments on smoking prevention on the early evening news hour -- these commenced the same day as the 1982 Surgeon General's Report was released (February 22nd)

2) A coordinated 5-day classroom curriculum for junior high school students -- modelled after those reported from Houston (Evans et al. 1978), Minnesota (Hurd et al. 1980), and Waterloo (Flay et al. 1983), utilizing same-age peer-led group activities with an emphasis on training social skills with which to resist social influences (peer, family, and media)
3) Home/Family activities -- homework assignments included viewing the TV segments and discussing them and/or completing an assignment with an adult
4) Five 5-minute TV segments on smoking cessation on the early evening news hour the following week, and
5) A written guide to quitting provided to all parents of participating students and any other adults who requested it directly from KABC.

The classroom program was provided to over 50,000 students in 153 schools in the L.A. viewing area by 600 teachers. An additional 30,000 people requested the written materials from the TV station. Sixty-three percent of students in program schools viewed at least one of the prevention segments (67% of them with someone else), while only 8% of control students saw any of the segments. In the second week, adults from 42% of homes of program students that included one or more smokers viewed some of the cessation programming, compared to only 13% from control students' homes.

In terms of effects, we found that a) knowledge, attitudes, social normative beliefs, and behavioral intentions were changed for program students, but only knowledge changed for control students (who were exposed to traditional health education programs), b) only half as many program students (7%) as control students (14%) tried their first cigarette in the two month period between pre-test and post-test, c) 14% of smokers in program students' homes (or 35% of those viewing any cessation segments), but only 4% of smokers in control students' homes (29% of these viewing) were not smoking at one-month follow-up, and d) 12% of other adults who requested program materials directly from KABC were not smoking at a two-month follow-up.

The above viewership patterns and program effects compare favorably with results from classroom-based smoking prevention programming (reviewed by others in this volume) and more than favorably with results from previous TV-based smoking cessation programs (see Flay 1983, for a review). We believe that the success of this program is attributable to factors implemented to overcome the three factors identified above -- program dissemination, selectivity, and interpersonal communication. This program was able to reach a large portion of the target audience because it: a) was coordinated with a classroom program (note the difference between program and control school students' viewership patterns), b) was aired at a popular viewing time, c) appeared coincident with the release of a new Surgeon General's Report that linked cigarette smoking to many more cancers, d) got students talking to their parents, thus influencing parents to tune in the second week, and

e) provided free information (booklets). Selectivity problems were reduced because a) students are a relatively captive audience for the classroom program, b) the classroom program was involving anyway because of its novelty, c) the program provided adolescents with social skills they desire, d) students were encouraged to get their parents involved, e) the Surgeon General's Report generated widespread discussion, and f) smokers were provided with tools for solving a problem that had been made salient. Interpersonal communication was increased a) among students because of the coordinated media and classroom program, b) between students and parents because of the built-in homework assignments, and c) among adults because i) parents sometimes talk to each other about the activities of their children, ii) quitters were encouraged to seek social support from spouses, friends, and other quitters, and iii) the Surgeon General's Report generated considerable media attention and discussion.

By utilizing the best technology available for classroom prevention programming and smoking cessation, and by encouraging family involvement, we successfully utilized mass media to reach large numbers of adolescents and their families with effective smoking prevention and cessation programming. It would appear that other successful mediated health campaigns also: a) maximized opportunities for individual exposure to the message (by using various media), b) made special efforts to attract individuals for whom health innovations were more salient (e.g., opinion leaders and high-risk individuals), and c) incorporated group meetings to increase expert and social interaction in order to increase salience and information flow in the community. Clearly, these mediating factors can explain, to a great extent, the difference between success and failure in media campaigns.

DISCUSSION

The Appropriate Role Of Mass Media In Drug Abuse Prevention

Lazarsfeld and Merton (1948) identified three conditions, one or more of which they believed to be necessary for mass media programs to be effective at behavior change. The first was monopolization (i.e., lack of counterpropaganda). Prevention-oriented programming will never monopolize the mass media. Indeed, commercial interests come closer to monopolizing them than prevention interests ever will. However, the current shift toward more prevention-oriented coverage will help to break that monopolization -- probably a necessary step if we are ever to succeed in prevention. The second condition identified by Lazarsfeld and Merton was canalization (i.e., moving existing attitudes into action). Most advertising works this way -- by channeling people from one brand to another. Smoking cessation programs probably owe part of their success to canalization. Many smokers want to quit -- they are just waiting for the right program to reach them at the right time. Prevention programming can utilize canalization to the extent that it helps adolescents maintain a desired status quo. Increasing their awareness of social pressure and giving them skills with which to resist it probably does this.

The third condition identified by Lazarsfeld and Merton was supplementation. This is the area where we believe the greatest advances can be made in the use of mass media for drug abuse prevention. Supplementation involves supplementing media programming with other activities such as school programs, small group discussion, community organization, face-to-face clinics, and changes in laws or their enforcement. Obviously, the most successful health promotion campaigns to date utilized the supplementation principle. The analysis we provide in this paper also suggests that supplementation is most important because it increases the effectiveness of media programming by: a) increasing the likelihood of program dissemination, by increasing the speed of agenda setting and diffusion and thus exerting pressure on gatekeepers, b) increasing interpersonal communication, because the issue is made salient to more people in different ways, and c) decreasing selectivity, by i) increasing access to captive audiences or ii) breaking down selection barriers by increasing interpersonal communication. Thus, we conclude from our analysis that the most appropriate role for mass media in preventing drug abuse is to increase the dissemination of program technologies found to be effective in other settings such as classrooms and clinics.

Research Implications

Research recommendations derived from our review and analysis are at three levels. First, there is a need for basic research on the effects of exposure to the "national" media. Second, there is an obvious need for a great deal of research on ways of improving program dissemination, decreasing selectivity, and increasing interpersonal communication. Third, focus on the above issues suggests a need for a greater emphasis on formative and implementation evaluation than on outcome evaluation, or more than has been accorded mass media drug abuse prevention programs in the past.

We provided a brief review of studies of the effects of viewing, reading, or hearing the many drug use messages in the "natural" media such as entertainment programming, news, and advertising. While there are many studies on the content of the natural media, and the extent of adolescents' exposure to it, there are few studies on the effects of such exposure. It is not yet possible to establish a causal relationship; more basic research is recommended. The studies by Smart and Fejer (1976) and Feingold and Knapp (1977) reviewed earlier, provide good examples of this level of research.

We have suggested many ways in which program dissemination may be improved, selectivity may be decreased, and interpersonal communication may be increased. However, minimal empirical data exist on the relative effectiveness or cost-effectiveness of these suggestions. The history of media effects illustrates dramatically the foolishness of relying on "common sense," or even "expert judgement," in reaching decisions about the relative cost-effectiveness of alternatives. Because it was widely believed that media caused big effects (the "hypodermic" or "bullet" model of communication), it was also widely believed that mass media would be the most cost-effective way of influencing the behavior of large audiences. Many reviews should by now have put these beliefs to rest, yet many practitioners still promote the false economy of the low cost of mass media products per member of the target audience. At this time, the relative cost-effectiveness of various ways of disseminating otherwise effective programming remains a researchable issue. Similar arguments apply to the issues of selectivity and interpersonal communication. Obviously, however, those approaches or methods that simultaneously address two or three of these issues, or even make them act synergistically, will probably have the greatest payoff in the long term.

In our previous writings on evaluation of mass media programs (Flay and Cook 1981; Flay et al. 1980), we have focussed on impact or outcome evaluation. The findings of this paper make it quite clear, however, that to focus on evaluation of the ultimate effects of mass media drug abuse prevention programs would be ill advised in many instances. The need to minimize selectivity and maximize interpersonal communication suggests that much research effort needs to be expended during product or campaign development. In particular, formative research of message concepts and trial products (e.g., Office of Cancer Communication 1979), and small-scale tests of the finished product, need to be emphasized. At each stage, there needs to be a concern with the acceptability to the target audience of the concept, message, or product. That is, can the product gain and hold the attention of the target audience? This can be assessed inexpensively by exposing a captive audience to the product within the context of a set of other media material designed to represent the real-world exposure context. The question being answered is, "Within the context of competing media messages, does the target audience attend to the being tested?" Thus, this type of formative evaluation also addresses the issue of selectivity directly.

The potential effectiveness (i.e., efficacy) of media product also needs to be assessed before program dissemination. This can be accomplished by testing exposed and unexposed (control) groups for relevant knowledge, attitudes, norms, and intentions. Tests of efficacy are concerned with the question of, "How effective will this product be if it reaches the intended audience and they attend to it?" Thus, relatively small-scale and inexpensive tests of the responses of samples of the target audience to the media products in a "captive" situation are appropriate. The suggested testing of acceptability and efficacy is comparable to the procedure developed at the Health Message Testing Service of NCI and NHLBI. Only after it has been established that an efficacious communications product has been developed, is it worth disseminating it. Then, the success of the dissemination implementation needs to be assessed. Implementation evaluation is concerned with determining things such as how and how well a program or campaign has been disseminated, where and how often a PSA has been aired, and where and to whom a pamphlet or other written material has been distributed.

Finally, there is a great need for more high quality outcome evaluation of mass media campaigns. However, only when it has been established that an efficacious product has reached the intended target audience with sufficent frequency is it worth the expense of attempting summative evaluation. It is at this stage that the choice between the three major paradigms discussed by Flay and Cook (1981) becomes relevant.

To conclude, we have suggested that more research is needed on ways of optimizing mass media drug abuse prevention program dissemination, minimizing selectivity, and maximizing interpersonal communication. This research is needed at both the basic and applied (evaluation) levels.

FOOTNOTES

[1] KNBC in Los Angeles, and some other NBC stations nation-wide, ran an anti-drug-abuse campaign, "Don't Be A Dope," during April of 1983. It consisted of PSAs, a reasonable number of which appeared during prime viewing times, one week of five-minute segments during the early evening news hours, a half-hour information program presented in a test format, "The Drug Abuse Test," and other activities.

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Social-Psychological Approaches

Alfred L. McAlister, Ph.D.

This paper provides an overview of what I believe to be the most important social-psychological variables influencing substance abuse behaviors. To stimulate our understanding of how social policy can influence substance use, I will present social-psychological notions in the context of larger, structural and normative influences on behavior. Most research is organized by differentiating categories based upon diagnostic or pharmacological concepts. I believe the key challenge to progress in this field is the development of schemata for classifying the causes of disparate phenomena across conventional categories of research. One way is to begin by categorizing causal variables as specific or general. Specific causes are those which have a clear relationship with a specific substance use behavior, but which do not directly influence other such behaviors. For example, the availability and advertising of tobacco may influence smoking behavior, but the marketing of cigarettes does not directly influence other substance use behaviors (although profits from cigarette sale may be invested in the marketing of alcohol). General causes are those which may influence several specific behaviors. For example, low socioeconomic status seems to increase many behavioral risks, from smoking to diet. Although this is an oversimplification, the specific/general concept may be seen to distinguish between two realms of research on the social psychology of drug abuse, i.e., between specific "belief/skill" and general "personality/environment" orientations. The concept also may be used to argue for the usefulness of considering drug abuse as part of some more fundamental sociocultural phenomena.

The significance of distinguishing between specific and general approaches is most evident when causes of behavior are categorized according to level of analysis: At the "macro" level are the broadest societal influences. The "meso" level is the direct social communication between individuals and their family and community. At the "micro" level are the psychological processes which control individual behavior. This categorization scheme does not necessarily imply a causal hierarchy in either direction, but a bidirectional flow with environments influencing individuals and individuals influencing their environments. When specific and general influences are differentiated first at the societal level, the implications of differences in underlying "meso" and "micro" processes are magnified.

"SPECIFIC" BELIEFS AND SKILLS

Possible specific influences at the societal level are not difficult to identify. Price, availability, and promotion of unsafe or unhealthy products such as handguns or substances such as cigarettes must bear some relationship with adolescent violence or smoking. Governmental legislation and regulation may also influence risk-taking behavior, e.g., lowered legal drinking ages (Smart and Goodstadt 1977). Another societal factor is the presentation of role models in mass media and other channels of cultural transmission. These structural, "macro" influences can become very powerful. For example, China's policy of harsh punishment for opium trafficking (death penalty for repeated offense) curbs opiate use while modeling and marketing tobacco led to steeply divergent trends in use of the two specific substances (Lowinger 1972).

Of course, these specific structural factors must be applied at the local level - particularly in the case of substances which can be easily grown in moderate climates. The enforcement of sanctions and the marketing of products depend upon the direct efforts of police and sales personnel. Furthermore, local schools, churches, ethnic groups, and other formal and informal organizations are often independent sources of specific influence on the behavior of children and youth (Sherif and Sherif 1974). Group norms are enforced both through explication of rules and implication of social desirability, and the two may contradict. Further diversity is introduced at the level of primary group, where families, teachers, and peer groups create environments which enforce norms and model behaviors idiosyncratically and are often resistant to external pressures. Parents and peers are the most proximal specific influences on the behavior of young people, e.g., for diet, smoking, violent behaviors. All social influences are themselves a product of the interaction between individual learning histories and larger forces in the community and society, i.e., marketing, and media models (Bandura 1977).

Behavior-specific influences at the level of individual psychology are the learned expectations and skills regarding specific behaviors. These probably can be understood in the context of current theories of "reasoned" cognition and learning (Fishbein and Ajzen 1975). For example, individuals smoke when they expect relatively immediate positive outcomes (admiration of peers, relief from anxiety, increased alertness) and when they know how to acquire and use cigarettes. Individuals choose not to smoke when they do not expect rewarding consequences to outweigh negative short- or long-term effects, and when they have the ability to resist specific social pressures toward smoking. These beliefs and skills are learned from direct and mediated observation and from experience. For any specific health behavior, it is theoretically possible to identify the behavior-specific cognitive structures associated with specific patterns of response. The most powerful process relating these variables to excessive use of drugs may be fueled by the perceived psychoactive effects of substances like alcohol and tobacco on affective-emotional experience (McAlister 1979). Alcohol is an effective sedative in large doses. Tobacco may make it easier to endure stress or remain alert. The processes reviewed earlier involved primarily social factors and are indisputably implicated in "social" drug-taking habits - i.e., those which produce no more compulsion or excess than the interpersonal circumstances demand. The interaction of the direct effects of substances like tobacco and alcohol with individual psychological factors may underly the establishment and persistence of chronic self-abusive drug-using behaviors (e.g., Cahalan and Room 1974).

To study the social and psychological processes involved in cigarette and marijuana smoking adoption we developed measures of four specific influences from four models: friends' smoking, parents' smoking, siblings' smoking, and parents' instructions regarding smoking (McAlister et al. 1982). We also developed measures of four clusters of beliefs about the consequences of smoking and three more general social-psychological factors which we thought might modify the influence of social factors. These variables were measured by multiple choice questionnaire items which were included in the larger baseline survey reported above. The items were selected after direct observational studies and exploratory factor analyses from a preliminary survey. We identified three independent belief clusters: Social desirability, Enjoyment, and Punishment. Health beliefs did not appear to be an organized factor, but an item measuring health beliefs was included in our analyses ("How often can a person smoke without it hurting their health?"). A confirmatory factor analysis was conducted on the baseline survey data using a maximum likelihood estimation procedure. The results are presented below. Anticipation of enjoyment was found to be the strongest cross-sectional predictor of smoking.

TABLE 1. Beliefs about Specific Consequences of Smoking: Factors and Item Loadings (n=1758)

	item loading
Social Desirability	
If I smoked, older kids would like me more.	0.693
If I smoked, I would have more friends.	0.644
Smoking cigarettes makes you look cool.	0.605
Anticipation of Enjoyment	
Kids who smoke have more fun.	0.594
If I smoked, I would feel more relaxed.	0.582
Punishment	
If I smoked, I would feel more uptight.	0.768
If I smoked, I'd be afraid of getting caught.	0.392

Correlation Matrix

	Enjoyment	Punishment
Social Desirability	0.532	-0.014
Anticipation of Enjoyment		-0.219

"SPECIFIC" APPROACHES TO PREVENTION

Modification of these substance-specific variables may be hypothesized to influence the probability that young adolescents will adopt substance-use habits. There is evidence that sharp increases in penalties for illicit drug use in adult populations can strongly influence long-term behavior patterns. Lowinger's (1972) finding that heroin use virtually disappeared from China when revolutionary law mandated harsh penalties can probably be attributed to a modification of beliefs about punishment similar to those expressed in table 1. But in our culture,the social and health costs of incarceration have led to a search for more enlightened approaches to prevention. Political values in the United States often favor efforts to reduce the need for prosecution and punishment through educational programs, although the balance between expenditures for educational and penal systems remains unsteady. Confidence in educational strategies is low because studies have shown that providing unbiased, factual information about the nature of psychoactive, dependence-producing substances does not reliably prevent abuse and may lead to increased experimentation (e.g., Stuart 1974). Perhaps that finding can be explained by the tendency for adolescents to be more influenced by beliefs about short-term enjoyable effects than by beliefs about long-term health consequences (Evans et al. 1979). Publicized herbicide spraying may be understood as an attempt to enhance the salience of beliefs about short-term health consequences in order to overcome the attraction of what some find to be subjectively enjoyable effects that are natural properties of psychoactive substances. Of course, the wisdom of such policies is highly debatable. In any case, most efforts to find specific educational solutions to the problem of drug abuse have been disappointing (Schaps et al. 1981).

As the social psychology of adolescent behavior is more fully considered, a number of more promising recent studies have investigated the effects of school-based efforts to alter the perceived social desirability of substance use and to "psychologically inoculate" non-users by training subvocal and interpersonal skills for resisting specific peer pressures toward particular behaviors (e.g., McAlister et al. 1980). Most studies have concentrated only on cigarette smoking behavior (Evans et al. 1979; Perry et al. 1980; Hurd et al. 1980; Schinke 1981; Puska et al. 1982) and evidence is accumulating which shows these methods to be highly promising as at least short-term deterrents to adolescent cigarette use. However, all current studies have suffered from two major methodological flaws: Nonrandom assignment to treatment and failure to use school-wide data as the unit of statistical analysis. Thus, although evidence so far is quite encouraging, one must be cautious in promoting the inference that such education programs can be effective (Fisher 1980).

To more fully assess the extent to which we can be confident in recommending the specific social-desirability-belief/peer-pressure-resistance-skill approach represented in the work cited above, we identified pairs of comparable junior high (grades 7 and 8) or middle schools (grades 6-8) in five administrative districts in Massachusetts and California (McAlister et al. 1982). The schools in each pair were randomly assigned to treatment or control conditions in a "matched-pair" design. Because the behavior of students within schools cannot be considered statistically independent, schools were the units of observation. Cooperation was obtained by providing parent and school representatives with detailed information about the preventive program and its experimental nature, and insisting that for one school to benefit both must agree to participate. Randomization was achieved by a coin flip in the presence of the two principals and their district representatives. Our research raised issues of privacy, and permission to measure student's behavior and their perceptions of family and friends' behavior was given on the condition that students not be uniquely identified by name or traceable code number. Without that provision, most of the students could not have participated in our research.

The "treatment" program was based upon previous research and our own experience. The cigarette smoking prevention component consisted of a two-year program of 12, 45-minute sessions for junior high and middle school students (ages 11 to 15) which were conducted by high school students (ages 15 to 18) under the leadership of our research team. The sessions were designed to interfere with the social influences which we hypothesized to cause adolescent smoking. Our objective was to train young nonsmokers to counter-argue subvocally against both overt and implied persuasive influences toward smoking and to behave comfortably in situations which include peer pressures to smoke. We assumed that adolescents respond to opportunities to engage in specific acts primarily because of anticipated social consequences, e.g., to impress friends by appearing "cool." Through the use of older nonsmoking peer models, the program was also intended to create new influences which would reduce the perceived social desirability of specific behaviors. We accepted the notion that psychopharmacological effects of nicotine play a role in the maintenance of smoking behavior, but we did not believe that beliefs about such effects were important to the 11- or 12-year-old students toward whom the program was directed.

The curriculum was based on pre-tested material developed during a pilot study (McAlister et al. 1980). Intervention sessions consisted of question-answer sessions, films, role plays, and simple contests. We also distributed buttons and stickers which were written by students, e.g., "I'm too cool to smoke." We encountered numerous administrative difficulties. Schedules were sometimes shifted unexpectedly because of heavy snowfall or teacher strikes. Classes were often too large or otherwise unmanageable, especially in the larger schools. Of course, many of these problems are typical of any school-based program of health education. Even when implementation was disrupted, the novelty of our peer-led program seemed to catch students' attention at least as well as most of the other educational efforts to which they were exposed. Because of organizational and structural problems, implementation of the research protocol was uneven across the five sites. Most sessions concerned with marijuana were not conducted in the California schools. In the largest California schools, very large classes and associated disruption of sessions was a severe constraint on program implementation. To a similar degree, the same problem was encountered in the two large schools in one of the urban Boston sites. In the suburban Boston site, a community group helped the control school to implement a smoking prevention program very similar to the one that was introduced to the experimental school. The most successful applications of protocol were achieved at the two smaller sites, where principal investigators were most frequently involved. These factors clearly introduce "noise" into the experimental design of the present study, but they are typical problems that represent the "real world" in which educational programs are applied.

Data were gathered in classroom settings with self-administered, anonymous questionnaires in 45-minute sessions led by trained graduate and undergraduate students from Harvard and Stanford. To increase the veracity of students' self-reports of smoking we conducted a "bogus pipeline" procedure in which saliva and some breath samples were collected and identified as a potential accuracy check (Evans et al. 1977). Measurements in the ten schools were taken four times: October 1979 (baseline); May 1980; October 1980; May 1981. Of the students enrolled and eligible for the study, 5% to 10% were absent from measurement sessions. School administrators estimate that between the first and last survey periods approximately 30% of the students transferred to other schools. Fluctuations in sample sizes introduce error to our estimation of trends in the different populations. But they are random with respect to treatment and do not threaten the internal validity of our inferences. In the inner city and California Valley schools with the greatest attrition, one-third of the original cohort participated in the complete study or about two-thirds of the total "possible" cohort, i.e., those who remained in the age-grades and schools that were being studied. The research sites were highly diverse: The two inner city districts consisted of middle schools which contained a majority of black students and were significantly lower in socioeconomic status than other sites. The two California sites included junior high schools with a large proportion of Hispanic students in the Valley district. The suburban district also contained junior high schools, and these were almost exclusively white. Students there were significantly higher in socioeconomic status than the California and inner city districts.

To test the effectiveness of the "treatment" program we compared changes in the proportion of self-reported smokers in each of the five pairs. In table 2 the percentage of self-reported regular smokers (monthly or more often) is presented for each school at baseline (October 1979) and follow-up (May 1981) for the sample of respondents who were matched across those two survey points (n=1150). In two of the sites there is an indication of markedly higher tobacco smoking onset rates in the control schools than in the treatment schools. In the third pair, there is a smaller difference in that direction, while in two remaining pairs there are modest differences in the opposite direction. Overall, the differences in follow-up smoking rates within pairs can be conservatively tested with a matched-pair t-test. For tobacco smoking, differences in follow-up rates between treatment and control units were at the borderline of statistical significance ($t_4=2.69$, $p < .07$ with one-tailed test). For marijuana smoking, the pattern of differences within pairs is not systematic. Smoking rates and rates of change are more variable than was expected, and whatever effects the experimental program might have had are difficult to distinguish with tests based on four degrees of freedom.

TABLE 2. Self-Reported Tobacco Smoking at Baseline and Follow-up (%)

	n	*Baseline*	*Follow-up*
Urban Boston I			
experimental	37	16.2	7.6
control	38	10.5	20.5
Urban Boston II			
experimental	101	8.0	11.9
control	66	10.6	20.0
N. Calif. Valley			
experimental	254	7.0	10.2
control	215	14.0	11.2
N. Calif. Coast			
experimental	56	7.2	3.8
control	100	4.0	15.3
Suburban Boston			
experimental	150	3.3	11.3
control	133	5.3	12.2

Some variability among the pairs can be interpreted in the context of variability in the implementation of the experimental program. The senior author participated in all phases of implementation in the smaller urban site and was often directly involved in problem-solving to overcome threats to effective program application in both urban sites in Boston. In the Northern California Valley site, organization and administrative constraints led the program to be delivered in very large classes (40-50). Project staff assigned to that site reported numerous disruptions and other problems and were not satisfied with the implementation. The decrease in smoking in the California Valley control school is not easily interpreted. In the suburban Boston site, the similar trends in both treatment and control schools can perhaps be attributed to the control school's unexpected access to aggressive preventive activities similar to the experimental program. In general, the variability of outcomes must be seen as a sign that results from small-scale studies may not be too hastily generalized and that complex experimental programs may not be easily disseminated.

"GENERAL" PERSONALITY AND ENVIRONMENT

More general influences on health behavior are less well understood, and there are few data to guide theorization (e.g., Mechanic and Cleary 1980). Little is known about whether or how superficially dissimilar health behavior problems are related. But some logical connections can be hypothesized and fitted into the framework that organizes my presentation. Based on broad theories of social psychology, one may hypothesize several factors which might generally influence health behaviors (McAlister 1980). For example, the absence of future orientation should bias decisions toward immediate effects and decrease the extent to which long-term health consequences are taken into account. Low self-esteem might have a similar effect. Poor stress-coping skill is another individual factor which may influence different health behavior problems, e.g., by increasing the salience of temporary psychological relief gained by smoking, drinking or overeating, or by limiting the capacity to make rational decisions. To the extent to which learning of a variety of health behaviors depends upon the quality of a child's relationship with family and school, alienation from those institutions can be expected to generally influence the development of diverse health behavior problems (Jessor and Jessor 1977). These general factors are important objects of research and were included in the study described above. The three general social-psychological factors were developed in a parallel fashion and the results of confirmatory analyses are presented in table 3. The factors were *Self-Image*, *Family Relationship*, and *School Relationship*. The findings suggest that disturbed relationships at home and at school are related, but independent; and that self-image is related to family relationship more than to school relationship.

To investigate whether the *specific* processes which seemed to be important in adolescent smoking are modified by these *general* social psychological variables, we followed recently specified procedures for comparing structural coefficients. Results showed that friends' smoking was a much stronger influence on the smoking behavior of students with disturbed family (unstandardized coefficient = 1.95; $p < .005$) or school (coefficient = 1.78; $p < .025$) relationships than it was on the behavior of the students who were close to their parents (coefficient = 1.22) and teachers (1.16). However, we did not observe significantly different effects in the corresponding groups of students with low or high estimates of self-image. These findings do not support the notion that self-image plays an indirect role in the onset of smoking, but do support the idea that alienation from parents and teachers is an indirect influence toward smoking.

TABLE 3. Social-Psychological Factors and Item Loadings (n=1772)

	item loading
Self-Image	
Things get so rough, I feel I can't win.	0.697
I'm nervous when I meet new people.	0.547
It's hard to tell if people like me.	0.421
Family Relationship	
I follow my parents' teachings.	0.715
When my parents tell me to do something, I obey.	0.501
I'm more confortable with my family than with my friends.	0.443
School Relationship	
I do things just to bother my teacher.	0.688
I enjoy doing things I shouldn't do.	0.567
Teachers pick on me.	0.466

Correlation Matrix

	Family	*School*
Self-image	0.296	0.115
Family Relationship		-0.384

These kinds of general, social-psychological qualities are themselves a product of general influences at the level of family and community. For example, Pratt (1976) has advanced the concept of the "energized family" to account for variations in the learning of diverse health behaviors, and lack of parental interest is associated with low self-esteem. The quality of schooling is another community-level variable with broad influence. Mechanic (1980) found low educational attainment to be associated with low rating of physical health, reports of emotional problems, failure to use seat belts, smoking and a sedentary life-style. Although many questions remain, there is growing evidence that a variety of health behavior problems are part of a broader pattern of disturbances in family, school and community relationships. These disturbances may themselves be the product of even larger forces, e.g., deterioration of economic conditions or international relations.

"GENERAL" APPROACHES TO PREVENTION

Efforts to intervene in these more general domains may be dismissed as naive, and problems such as unemployment or the threat of nuclear war certainly raise political issues that are more complex than those surrounding specific disease-related policies (Mechanic 1979). On the other hand, our society may be greatly in need of unifying concepts that can help focus fragmented disease- or substance-specific concerns and pressures on questions about how society can meet its most basic and pressing challenges. Furthermore, if interventions can be found which do alter general health-related variables, the broad impact on multiple health problems may be worth the cost of actions more fundamental than the substance-specific programs described in the preceding section.

There is evidence that some basic components of self-efficacy can be improved and generalized in order to reduce the onset of diverse problem behaviors. The most relevant area of research is on the teaching of social skills and competencies related to resistance to persuasion (McGuire 1968; Schinke 1981; Sarason 1981). Botvin and colleagues (e.g., Botvin et al. 1980) have conducted a series of studies testing the effects of broad social skills training and related self-esteem and coping enhancement activities on the onset of cigarette smoking. Cigarette-specific skills training is included in the programs. This study has methodological shortcomings omitting attribution of effects to the modification of general social-psychological factors. But it points with promise toward a high priority area for future research. Perhaps the most important question is whether behavioral education can produce enduring improvements in self-esteem and efficacy without more difficult alterations in family and neighborhood environments. Even the most sophisticated educational programs directed toward young people may fail in the face of family disturbance or early failure at school (Kellam et al. 1982).

There is great challenge and promise in efforts to improve family and school relationships. A large accumulation of evidence indicates that alienation from family and school is a general predisposing factor toward multiple substance use and other problem behaviors (e.g., Jessor and Jessor 1977). But few investigators have been bold enough to intervene to reduce such alienation as a method of preventing drug abuse. An exception to this is the work of Bry and colleagues (Bry 1982; Bry and George 1980). These stimulating reports suggest that intensive efforts to improve school attendance and achievement may be successful. However, the small number of subjects and short time-span of these and related studies are weaknesses which reduce confidence in their implications. Very recently, The National Institute of Drug Abuse has supported more extensive investigations of efforts to modify general social-psychological variables. The most promising is a randomized study of family relationship improvement[1] that is being conducted by Szapocznik and colleagues at the Spanish Family Guidance Center in Coral Gables, Florida. Another important study[2] is being conducted by Gersick and colleagues at the Connecticut Mental Health Center in New Haven, Connecticut. These studies represent ambitious efforts to test the effectiveness of general approaches to substance abuse prevention. They illustrate a high priority area for further and more rigorous empirical study. The cost of programs designed to address the basic school/family relationship may be great. But if they can act as a general deterrent of multiple health-related behaviors, the investment may be highly worthwhile.

Of course, it may not be possible to improve family and school relationships to any significant degree in conditions of high unemployment or other sources of stress and social deterioration. Despite the magnitude of such pressing structural problems, they are not necessarily beyond the scope of social-psychological analysis or intervention. Although it may be nearly impossible for the entire range of specific public health benefits to be evaluated, social scientists should not avoid opportunities to use their skills to address the "macro" issues which they believe to be of most general concerns.

In a recent study in Boston, an effort was made to investigate the short-term psychological impact of altering an important structural variable: Eighth grade students were randomly assigned to receive enhanced opportunity for summer employment related to long-term career goals (McAlister and Edwards 1983). The study design was implemented in an inner-city, minority setting of high youth unemployment where the number of government-sponsored summer jobs had been sharply cut. All study students completed an interview at the beginning and end of their 8th grade school year. The interview included measures of future orientation, self-esteem,and coping styles. Experimental subjects participated in a series of weekly classroom sessions and field trips designed to increase social support and self-esteem and to improve coping skills. The summer jobs were a very salient part of the intervention: There was anecdotal evidence of short-term increased attendance when the special forms were passed out. Self-esteem was enhanced by direct social approval and by identification of positive qualities. Coping skills were trained by actual problem-solving in small groups where students were urged to express their most pressing problems, to discuss solutions and to apply possible solutions experimentally. All sessions were led by a group of Harvard undergraduates with a cultural background similar to that of the study participants.

Follow-up differences between self-reports of relevant variables are presented in table 4. The experimental subjects tend to develop more positive future-orientation and greater self-esteem and self-efficacy. The difference is significant ($p < .05$) for future-orientation and at the borderline of significance ($p < .10$) for self-efficacy, according to the Kolmogorov-Smirnov test (one-tail test). The trend for self-esteem is not significant. Data were not available from about one-third of the participants, with no differences in attrition between groups. These are, of course, short-term findings and probably do not indicate stable differences. Furthermore, the experimental methods are probably not generalizable. Nevertheless, these tentative data point toward what may be an important direction for future, more substantial studies. If important, general variables related to "personality and environment" can be altered, some promising possibilities are encountered. By concentrating efforts on the most generally important or central factors, diverse improvements in specific behaviors may be facilitated. Although behavior-specific preventive measures may be easier to identify and fund, generalized approaches may be the most fruitful in the long-term. "General" factors may be the most resistant to change, but their importance probably merits a coalition of interests broader than those formed by current research organization.

TABLE 4. Follow-up Group Differences in Future-Orientation and Self-Esteem

	n(%)	
Future Orientation Do you "look forward" to your future?	experimental	control
Yes	27(90)	18(58)
Undecided	3(10)	9(29)
No	0(0)	4(13)
Self-Esteem Do you "like" yourself?		
Yes	31(100)	26(81)
Undecided	0(0)	4(13)
No	0(0)	2(7)
Self-Efficacy Could you "do something about" a recent problem?*		
Yes	15(65)	12(52)
Undecided	6(26)	2(9)
No	2(9)	9(39)

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*For those reporting a recent problem.

CONCLUSIONS AND RECOMMENDATIONS

The most important conclusion is a familiar one: methodological problems must be overcome before we can confidently make inferences about how substance abuse can be prevented. Variability among schools or other settings is sufficient to require that aggregated data from such settings be viewed as the proper unit of analysis. Large-scale research with large numbers of schools will be needed to rigorously assess the effects of experimental prevention programs.

Effective tracking procedures are also needed. To assure the accuracy of outcome data, "bogus-pipeline" or, ideally, actual physiological or observational measures are necessary.

Researchers should concentrate on experimental, rather than correlational, studies. Much is already known about the kinds of variables which predict substance use. Much less is known about how those variables can be modified and whether such modification can influence rates of substance abuse. Only experimental studies can produce strong causal inferences and clear implications for policy.

Promising approaches to "specific" belief- and skill-based prevention have been identified and these are ready for large-scale field trials. Smoking prevention strategies based on peer leadership and psychological "inoculation" appear to have at least short-term effects. Whether these strategies may be usefully applied to the prevention of marijuana smoking or alcohol abuse remains in question. The long-term effects of such programs are not known.

Promising "general" approaches are emerging more slowly, but should be considered as an equally high priority for smaller-scale experimental studies. There is evidence that generally important social skills can be trained and that family and school relationships can be improved. It is important to learn whether such improvements can be achieved on a large scale in order to prevent diverse problem behaviors. General approaches to prevention may require substantial and sophisticated investments in socialization systems. But if general approaches effectively prevent the mortality, morbidity and other social costs associated with a range of negative health behaviors, the investment may be worthwhile.

FOOTNOTES

1. Family Effectiveness Training, NIDA Grant No. R01 DA 02694.

2. NIDA Grant No. R01 DA 02721. Contact NIDA or Dr. Kelin Gersick, Department of Psychiatry, Yale University School of Medicine, 34 Park Street, New Haven, Connecticut 06519.

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Doing the Cube: Preventing Drug Abuse Through Adolescent Health Promotion

Cheryl L. Perry, Ph.D., and
Richard Jessor, Ph.D.

Drug abuse among adolescents has become a major health concern in American society. The relation of drug abuse to motor vehicle mortality and morbidity, to long-term chronic diseases, and to other risk-related behaviors such as precocious or unprotected sexual intercourse is now generally recognized. With earlier onset, wider prevalence, and heavier involvement in health-compromising behaviors (especially tobacco, alcohol and marijuana use) has come broader interest in the possibilities for intervention. Over the past decade, interest has also grown in the concepts of health and of health promotion. The conceptual linkages that unite these two interests, the prevention of drug abuse and the promotion of health, are the key concerns of this paper.

The first major aim of the paper is to help clarify the meaning of health promotion as an intervention modality. The sketching out of a conceptual framework from which to view health promotion makes it possible to examine its aims, its structure, and its approach in a more logical fashion. The major health promotion programs that have included a drug abuse prevention component are then reviewed by employing that conceptual framework; that is the other major aim of the paper.

Among the variety of intervention options and programmatic components, it is necessary to stress at the outset that it is not currently possible to assert what is really effective empirically. The reason for this is not that the health promotion projects to date have not been innovative and insightful, but that health promotion research and the complexities of such large-scale projects have yielded, thus far, only partial results, and their outcomes have not been compelling.

Still, health promotion has gained considerable momentum and support; the programs have achieved greater specification of key intervention elements; and some promising results are beginning to emerge. In exploring how adolescent health promotion can have logical relevance for the prevention of drug abuse within these programs, this review may also serve to illuminate the larger potential of that approach.

TOWARD A CONCEPTUAL FRAMEWORK FOR HEALTH PROMOTION

It seems necessary, first, to provide some conceptual clarification of the notions of "health" and "health promotion." Each carries a range of meanings that have differing personal, social, and political significance. The terms health and health promotion are generally used without explicit definition and with an assumption that there is broad consensus on their meanings. Clearly, that is not the case.

The Concepts of Health and Health Promotion

With respect to health, most definitions tend to emphasize variation in illness. Historically, health has been defined as a residual category, that is, as the absence of disease. More recently, definitions such as that of the World Health Organization have a more positive character: health is a "state of complete physical, mental, or social well-being and not merely the absence of disease or infirmity" (WHO,1958). Other definitions have emphasized effective social functioning, adequate role or task performance, realistic personal aspirations, the ability to cope and adapt, or simply extended longevity (Baranowski 1981). The more recent definitional literature on health, while still not providing explicit criteria for health, or the specific competencies required to be labelled "healthy," does alert the reader to domains of health other than merely physical. In so doing, it provides us with a more positive definition than just the absence of disease.

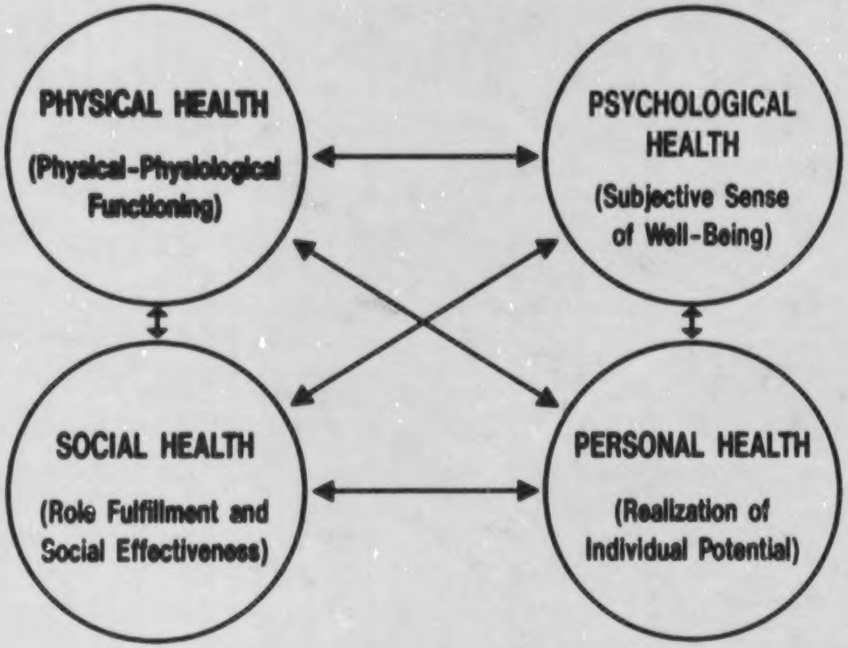
The concept of health promotion remains even less fully explored. Its usage overlaps considerably with the notion of disease prevention, largely reflecting, again, a view of health as the absence of disease. Health promotion is generally associated with changing particular health practices or health-related behaviors. In Healthy People (1979) for example, health promotion is used in relation to cessation of smoking, reduction of alcohol and drug use, control of stress, modification of unhealthy diet, and increase of exercise. Such a listing of what are mainly behavioral deletions is quite characteristic of most definitions of health promotion. Something similar appears in the Canadian Lalonde Report (1974) and is also evident in the well known list of health practices suggested by Belloc and Breslow (1972).

In more recent publications, the concept of health promotion has been elaborated to be more broadly encompassing. Thus, it now includes "health education and related organizational, environmental, and economic interventions designed to support behavior conducive to health" (USDHHS 1981), and "efforts to reduce unhealthy behaviors, improve preventive services, and create a better social and physical environment" (McAlister 1982). These definitions, as well as those of others (Taylor 1981; Rootman 1982), make clear that health promotion is concerned with more than the reduction or deltion of specific, health-compromising behaviors, that it may involve a variety of methods to instigate the adoption of alternative behavior, and that it can extend to include environmental changes that would serve to support such adoption.

From our own viewpoint, the concept of health encompasses at least four interrelated domains. As may be seen in Figure 1, these include physical health, psychological health, social health, and finally, what we call personal health. Physical health refers to processes of physical and physiological functioning and their adequacy and efficiency. An indicator of at least minimal health in this domain would be the lack of dysfunction, with other indicators (e.g. blood pressure, cholesterol measures, resting heart rate, carbon monoxide) used to assess varying degrees of physical health. Psychological health refers primarily to a subjective sense of well-being, a self-appraisal of how one generally feels. It involves such areas as a self-concept of personal competence, the sense of fitness and energy, feelings of well-being, and internal locus-of-control. An indicator of a state of minimal psychological health might be not being depressed. The third domain of health, social health, refers to a person's social effectiveness: the ability of the individual to fulfill tasks, perform roles, and learn necessary skills for adaptive functioning within the social setting. An indicator of at least a minimal state of health in this domain might be the ability to carry out the basic tasks and skills of assigned roles. Personal health is the final health domain. By personal health, we mean something that goes beyond adequate or effective functioning in the other three domains. By speaking of health of the person, we want to emphasize the possibility of inner capabilities, resources, and talents of an individual that may not be tapped or elicited by the ordinary circumstances of everyday life. A concern with personal health implies that, within the individual, there is potential for fulfillment of other dimensions of the person, ones that are not necessarily instrumental, and that permit the full

FIGURE 1

Domains of Adolescent Health


PHYSICAL HEALTH
(Physical-Physiological Functioning)
PSYCHOLOGICAL HEALTH
(Subjective Sense of Well-Being)
SOCIAL HEALTH
(Role Fulfillment and Social Effectiveness)
PERSONAL HEALTH
(Realization of Individual Potential)

development of what a person can become. A minimal indicator of personal health might be a viable interest in activities and experiences that enable the person to transcend the status quo.

The relevance of these multiple domains for defining health becomes obvious when considering drug abuse as behavior that is health-compromising for adolescents. If only physical parameters are used, then concern about the health-compromising consequences of drug abuse would be limited primarily to drug-related accidents and injuries and, in the long term, to chronic disorders and morbidity. But this would exclude from consideration the compromising consequences of drug abuse in the other domains of health; Figure 2 provides examples of some of these.

We should make it explicit here that our use of the term "drug abuse" refers to that level of drug use (either frequency or intensity) that impairs healthy functioning in at least one of the health domains. At the same time, it is important to recognize that more moderate levels of drug use may not compromise the health of the user and, in some instances, could conceivably be health-enhancing.
Health promotion can now be seen, following this definition of health, as the implementation of efforts to foster improved health and well-being in all four domains of health.

Complementary Strategies for Health Promotion

Efforts to promote health can be divided into two main types: those that are oriented toward weakening, reducing, and eliminating behaviors that compromise health; and those that are oriented toward introducing, strengthening, and reinforcing behaviors that enhance health and that may, in addition, be incompatible with health-compromising behavior. Emphasizing both of these complementary strategies for health promotion makes it clear that health enhancement can not be seen simply as a residual outcome of reducing health-compromising behavior. Neither can it be seen as including only direct efforts to advance health while ignoring the necessity of reducing health-compromising behavior at the same time. A comprehensive approach to health promotion should represent the optimal balance of attention to strengthening health-enhancing behavior and, simultaneously, to reducing health-compromising activities (see Figure 3).

In any discussion of such categories of behavior as health-compromising and health-enhancing, it is important to under-

FIGURE 2

Adolescent Drug Abuse As Health-Compromising Behavior

PHYSICAL HEALTH

- Accidents
- Increased cancer risk
- Cardiopulmonary efficiency reduced

PSYCHOLOGICAL HEALTH

- Sense of dependency
- Reduced self-esteem
- Sense of external control
- Apathy

SOCIAL HEALTH

- Delinquent behavior
- Poor school performance
- Interpersonal difficulties

PERSONAL HEALTH

- Reduced range of interests
- Limited energies
- Restricted exploration of opportunities for growth

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FIGURE 3

ADOLESCENT HEALTH PROMOTION:
Complementary Strategies

Introducing and/or Strengthening Health-Enhancing Behavior

- Regular aerobic exercise training
- Social skills development
- Regular use of contraception
- Developing new interests

Eliminating and/or weakening Health-Compromising Behavior

- Reducing frequency of marijuana use
- Drinking-driving prevention
- Reducing excessive television involvement
- Minimize fast food consumption

stand the relations *among* the behaviors in each category and between the categories. Thus, it is already clear that there is strong evidence for covariation among at least some subset of health-compromising behaviors, e.g., drug and alcohol abuse, smoking, precocious sexuality, and delinquency, and that they may constitute a syndrome (Jessor 1983a). Evidence for similar covariation among health-enhancing behaviors is, at this point, slim. Evidence for an inverse relationship between health-enhancing and health-compromising behavior is essentially non existent. Yet these possible patterns of relationship among health-related behaviors would have enormous significance for the kind of complementary health promotion approach emphasized here. In our view, this is an area that warrants immediate and extensive research attention. Irrespective of the ultimate findings about covariation within and between these two categories, however, health promotion, as an approach, should be seen as logically encompassing *both* strategies.

Foci of Intervention

Given both strategies, the next issue is just how to implement them, that is, how to intervene to strengthen health-enhancing and, at the same time, to diminish health-compromising behavior? In short, what is really being asked is a more general question, namely, how to achieve change in social behavior, especially health-compromising behavior such as drug abuse?

Answering that question requires reliance on theory about the kinds of factors that are related to and can influence the occurrence of behavior. In the last decade or two, a number of formulations have been developed that are relevant to our concern with health-related behavior and behavioral change. Although our perspective is most directly influenced by one of those, namely Problem-Behavior Theory (Jessor and Jessor 1977), it is a perspective that is shared by a number of different social-psychological approaches. What is common to them is a concern with three major levels of analysis; (1) the level of behavior, (2) the level of personality, and (3) the level of environment, and an awareness that efforts to change behavior can be focused at any one, or all, of those levels (Bandura 1977; Fishbein & Ajzen 1975).

The possibility that Problem-Behavior Theory can be apposite to the domain of health-compromising behavior as well derives from a consideration of the overlap that exists among three conceptually different categories of behavior: problem-behavior, health-compromising behavior, and psychopathological behavior. As can be seen in Figure 4, there is a substantial intersection of these three realms. That intersection includes a number of the behaviors that have been dealt with in the past by Problem-Behavior Theory and that are now of concern to us because they can be seen simultaneously, and unequivocally, to be health-compromising.

Further elaboration of the implications of Problem-Behavior Theory for behavioral health can be found elsewhere (Jessor 1983b); our present aim is to incorporate into our health promotion conceptualization the three levels, behavior, personality, and environment, at which interventions can be directed in efforts to promote health.

Health-related interventions at the level of behavior would focus on weakening or eliminating particular health-compromising behaviors. Smoking cessation programs and alcohol moderation campaigns exemplify such efforts, directly focused as they are on the behavior of concern.

Still at the level of behavior, interventions can also focus on introducing or strengthening other behaviors that can serve as substitutes for or alternatives to the behaviors of concern, and may also be incompatible with drug use, such as running vis-a-vis smoking, new hobbies or social activities that serve psychological functions similar to those of drinking and drug use.

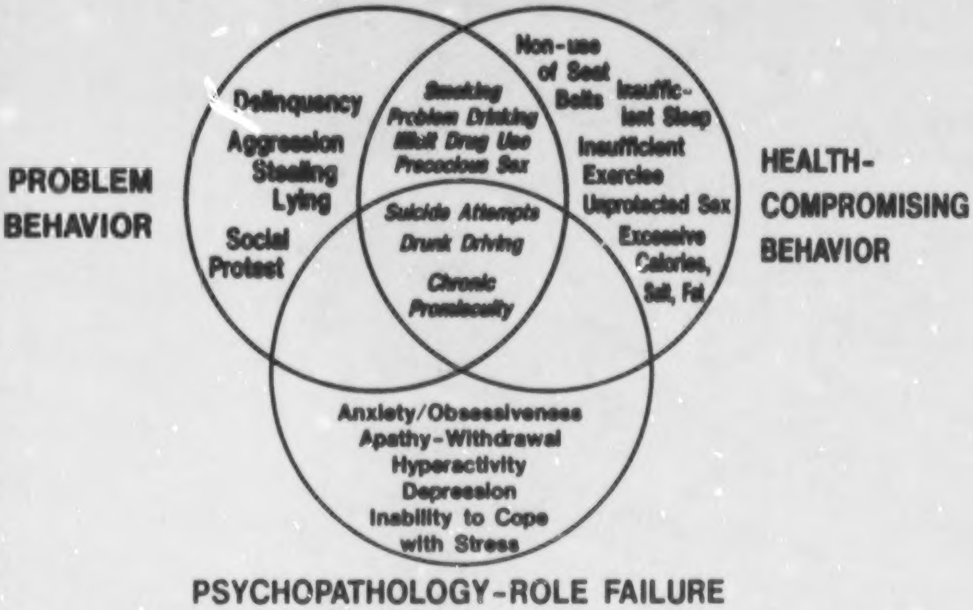
Health-related interventions at the level of personality would focus on reducing the strength of particular personality dispositions that sustain health-compromising behaviors including drug use, for example, risk-taking orientation, tolerance of deviance, or sensation-seeking tendencies.

Still at the level of personality, health-related interventions can also focus on introducing or strengthening other personality dispositions that could increase the likelihood of health-enhancing behavior, such as increasing personal value on health and fitness, strengthening internal locus-of-control about health, or teaching the importance of a sense of social responsibility.

At the level of the environment, health-related interventions would focus on eliminating or weakening those aspects of the environment that support or permit engagement in health-compromising behaviors, for example, access to health-

FIGURE 4

Behavioral Domains Relevant to Adolescent Health Promotion


PROBLEM BEHAVIOR
Delinquency
Aggression
Stealing
Lying
Social Protest
Smoking
Problem Drinking
Illicit Drug Use
Precocious Sex
Non-use of Seat Belts
Insufficient Sleep
Insufficient Exercise
Unprotected Sex
Excessive Calories, Salt, Fat
HEALTH-COMPROMISING BEHAVIOR
Suicide Attempts
Drunk Driving
Chronic Promiscuity
Anxiety/Obsessiveness
Apathy-Withdrawal
Hyperactivity
Depression
Inability to Cope with Stress
PSYCHOPATHOLOGY-ROLE FAILURE

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compromising materials such as drugs, exposure to influential models for health-compromising behavior, and social support for engaging in such behavior.

Still at the level of the environment, interventions can also focus on providing access to, or creating opportunities for alternative health-enhancing behavior, promoting exposure to influential models who exhibit health-enhancing behavior, and making available reinforcement for positive changes in behavior.

Interventions at any of these levels, and by either major strategy, should be judged successful, we would argue, to the extent that they reverberate across all four domains of health. The more domains that an intervention impacts, the greater the effect would be on health. In designing, selecting, or implementing particular intervention efforts or options (whether at the level of behavior, personality, environment, or any combination of these levels), consideration should be given to the breadth of their impact across the four domains of health. Interventions that impact more of the domains are obviously to be preferred.

To review, the major emphases that we have discussed in conceptualizing health promotion can be seen as constituting three dimensions. One dimension involves the four domains of health: physical, psychological, social, and personal; the second dimension includes the two strategies for health promotion: weakening or eliminating health-compromising behavior, and introducing or strengthening health-enhancing behavior; and the third dimension consists of the three foci of intervention: behavior, personality, and the environment. These various considerations generate a three-dimensional model that can be represented as a cube (see Figure 5).

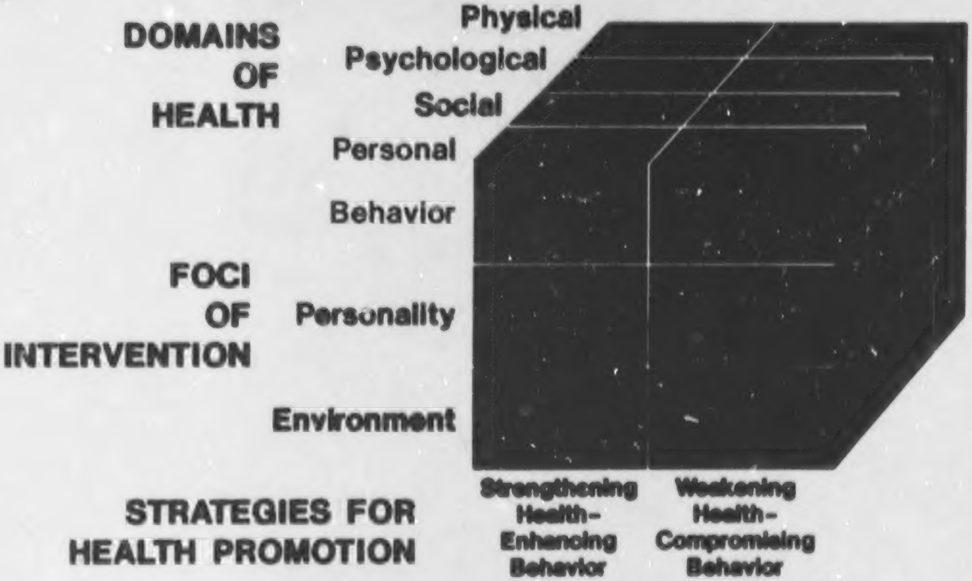
The fundamental position taken in this paper is that a comprehensive approach to drug abuse prevention through health promotion would require "Doing The Cube."

MAJOR HEALTH PROMOTION PROGRAMS

Using the health promotion framework provided by the cube, we can turn more systematically to the literature that focuses on health promotion and adolescent drug abuse interventions. We have restricted our purview to those major programs of intervention research that have smoking, drinking, or marijuana use by adolescents as dependent measures, yet have health as an

FIGURE 5

Doing the Cube :
A Three-Dimensional Model of Adolescent Health Promotion


DOMAINS OF HEALTH
Physical
Psychological
Social
Personal
Behavior
FOCI OF INTERVENTION
Personality
Environment
STRATEGIES FOR HEALTH PROMOTION
Strengthening Health-Enhancing Behavior
Weakening Health-Compromising Behavior

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intervention focus. Most other kinds of intervention approaches can also be mapped onto the cube conceptually. However, since they are, for the most part, aimed more at drug abuse prevention than at health promotion, we have excluded them from this review. Because the first author is responsible for youth education for the Minnesota Heart Health Program, it seems appropriate to begin with a description of that program and to present somewhat more detail and program description about it than will be possible with the other programs.

The Minnesota Heart Health Program is a community-based demonstration project to enhance cardiovascular health and to reduce morbidity and mortality from cardiovascular diseases (heart attack and stroke) in three northern midwestern communities. The approach involves a nine-year education program in the communities, annual risk factor assessments on a sample of the adult populations in three "educated" and three comparison communities, and morbidity and mortality surveillance. The education program is aimed at the entire community, including children, adolescents, and the elderly. Significant changes in smoking prevalence, eating patterns, physical activity levels, and hypertension management are targeted objectives (Blackburn et al. 1983; Mittelmark et al. 1983).

Youth are viewed as a specific target group within the larger educational program (Perry and Murray 1982). Interventions for youth parallel the organizational design of the adult education program and reflect the special expertise of the youth working group. Three types of intervention modalities are used: health behavior campaigns, educational interventions, and community-organization programs (see Figure 6).

Health behavior campaigns focus on changes at the larger, impersonal environmental level. These emphasize awareness, knowledge, motivation, trial behavior, and larger environmental changes. An example of a campaign around smoking is the recent community-wide Quit and Win contest (Pechacek 1983). The contest encouraged adult smokers to Quit and Win by providing a drawing for a prize (a trip to Disneyworld funded by the local community) to contestants who quit smoking and remained non-smokers throughout the month of January. Adolescents also became involved in this effort through their initiation of Kwit Smoking This Year (KSTY) interviews about smoking with adults in the community. The leading adolescent KSTY interviewer, that is, the student who had interviewed the most adults, was recognized and rewarded with a 10-speed bicycle. Children in elementary schools were also involved

FIGURE 6

Minnesota Heart Health Program : INTERVENTION MODALITIES

HEALTH BEHAVIOR CAMPAIGNS

- Kwit Smoking This Year Interviews
- Quit and Win
- Dining a' la Heart
- Get Ready for the 21st Century
- Jog 'n Log
- Volksmarche
- T.V. "Premiere"

TARGET GROUP INTERVENTIONS: *Youth*

- Heart Health Centers
- Hearty Heart and Friends
- Keep It Clean I, II
- Slice-of-Life Health Skills Program

COMMUNITY-BASED PROGRAMS

- Community Steering Committee
- Task Force on Smoking
- Student Health Representatives
- Peer Leadership Training

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directly by being instructed by Mickey Mouse, in a visit to their classrooms, on how to encourage their parents or other relatives to join the Quit and Win contest.

Educational interventions are the second modality, and their focus is on changes in the immediate, personal environment of individuals in the community and of targeted subgroups. They include behavioral screening centers and special classes aimed at changing health behavior. Targeted subgroups include, among others, health professionals, physicians, restauranteurs, grocers, church attendees, and employees in particular organizations. The programs for youth tend to be school-based, skills training, behavior change programs. Hearty Heart and Friends, for example, is a twenty-hour program designed to change eating and exercise patterns among third and fourth grade students. It includes a slide-tape cartoon adventure series depicting health-enhanced and health-compromised archetypal characters, food selection and cooking skills, regular aerobic physical activity, and homework which involves skills practice assignments.

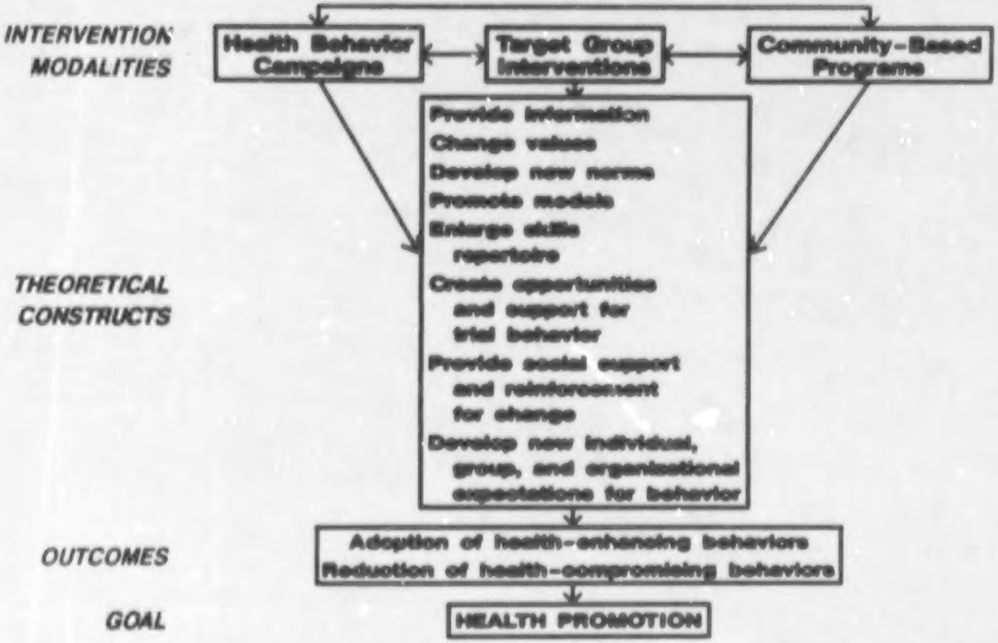
Community-organization programs, the third modality, focus on changes in the social environment through the identification and education of key community leaders, organization of task forces on the overall program, smoking, eating, exercise, and hypertension, and community-initiated projects such as community-wide walks (Volksmarching) and changes in grocery store food product labeling. Students in junior high school are elected as health council representatives. They are trained as peer leaders to conduct our junior high school drug abuse prevention program, "Keep It Clean," and initiate their own projects, such as health newspapers or cross-age teaching on health.

All of these activities are designed to promote behavior change. To accomplish that, we feel it is necessary, theoretically, to: provide health-related information, change values on health, develop new norms for health-related behavior, promote models for health-enhancing behaviors, enlarge the health skills repertoire, create opportunities and support for trial behavior, remove barriers to behavior change, provide social support and reinforcement for change, and develop new individual group, and organizational expectations for behavior (see Figure 7).

What is expected, as the outcome of the youth intervention activities seeking to effect these environmental, behavioral,

FIGURE 7

Minnesota Heart Health Program :
EDUCATIONAL PROGRAM



INTERVENTION MODALITIES

Health Behavior Campaigns

Target Group Interventions

Community-Based Programs

THEORETICAL CONSTRUCTS

- Provide information
- Change values
- Develop new norms
- Promote models
- Enlarge skills repertoire
- Create opportunities and support for trial behavior
- Provide social support and reinforcement for change
- Develop new individual, group, and organizational expectations for behavior

OUTCOMES

Adoption of health-enhancing behaviors
Reduction of health-compromising behaviors

GOAL

HEALTH PROMOTION

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and personality level changes, is the adoption of certain health-enhancing behaviors (healthy eating, regular physical activity, sufficient sleep, seat belt use) and the reduction of certain health-compromising behaviors (salt and fat consumption, tobacco smoking, excessive drinking, and marijuana use). These specific intended outcomes are being measured at a community-wide level with targeted adolescent cohorts in both the intervention and the comparison communities to assess the overall impact of these efforts. Outcomes are also being measured within the intervention communities, to assess the relative effectiveness of particular intervention strategies. Since the project is still in an early stage, empirical findings are not yet in hand, and no evaluation of the success of the approach can be made at this time.

Although it is not possible to provide a description and analysis of all the other health promotion programs at this level of specificity, this overview of our program should help to clarify how particular theoretical constructs suggested by the cube can be implemented within a health promotion program. What has been left out of even this discussion, however, ought not to be minimized, namely, the enormous time, cost, ingenuity, and effort that are required to translate theory into specific strategies and programs within a given community. It is precisely these more pragmatic considerations that ultimately have decisive influence on the effectiveness of any health promotion program.

The other programs to be reviewed are all large-scale health promotion projects that have, as one outcome goal, the reduction of adolescent smoking, drinking, or drug use. Programs that meet these criteria include: the Stanford Heart Disease Prevention Program, the Pawtucket Heart Health Program, the Chicago Heart Health Program, the North Karelia Project, the Oslo Youth Study, and the International Know Your Body Program.

The Stanford, Pawtucket, and North Karelia Projects are all concerned with improving cardiovascular health and reducing morbidity and mortality from cardiovascular disease at the community level. Each also includes a youth component. The Oslo Youth Study, the Know Your Body Program, and the Chicago Heart Health Program are concerned with the prevention of chronic diseases such as cancer and heart disease, and are targeted solely toward youth. In this presentation, we will restrict our description to the youth components of the various projects and their outcomes, especially in regard to drug abuse prevention.

The North Karelia Youth Project included an educational intervention in four schools within the targeted county in Finland (Vartianinen 1982). Two schools were involved in intensive interventions directly involving project staff. Two other schools participated in the intervention but relied on regular school staff. Two schools in the reference county served as controls. The interventions were conducted over a two-year period with 13-to-15-year-old students. The intervention consisted of reduced fat and salt in the cafeteria offerings, classroom instruction on nutrition and health, home visits with high-risk students by a nutritionist, risk factor screening and review (using a Health Passport), parent meetings on health education, and a peer-led smoking prevention program. At the end of two years, students in the intensive intervention schools reported significant decreases in fat consumption and, for girls, there was a reduction in cholesterol levels compared to students in the control schools. No significant changes in blood pressure or salt use were noted. With regard to our present concern with drug abuse prevention, students in the intensive intervention program had a lower smoking prevalence rate than students in the control schools, according to their self-reports.

The Stanford Heart Disease Prevention Program included smoking and drug use prevention interventions for junior and senior high school students as the youth component of the program. Two junior high schools and four high schools received educational interventions. For the junior high intervention, two junior high schools within the target communities served as control schools. The junior high intervention was conducted over a two-year period with 13-to-15-year-old students. The intervention consisted of a peer-led drug abuse prevention program involving social skills training sessions, school environment changes (including P.A. announcements, posters, and T-shirts), and an alternatives program involving health education and exercise for high-risk students. The high school smoking intervention employed a within-school design to compare three intervention approaches. The program involved classroom teachers and college students who taught social skills, demonstrated physiological effects of smoking, and introduced cessation methods to students in health education classes. At the end of two years, students in the intensive junior high program had a lower self-reported smoking prevalence rate than did students in the control schools (McAlister, personal communication). At the end of the first year, students in all of the high school programs showed significant reductions in smoking rates, as indicated by their self-reports (Perry 1983).

The Pawtucket Heart Health Program includes school district curriculum revisions in health education and some intensive interventions (Rosenberg 1983). Programs in grades 3, 6, and 9 involve classroom instruction in heart health, nutrition, and physical activity. An intensive peer-led smoking prevention program is currently being implemented in two schools. At the end of the first year of the study, no data on behavioral outcomes related to drug use are as yet available.

The Oslo Youth Study included an educational intervention in three schools in Oslo, Norway. All three schools received intensive interventions directly involving project staff; three additional schools in Oslo served as controls. The interventions were conducted over a two-year period with 13-to-15-year-old students. The intervention components were essentially the same as those described for the North Karelia Youth Project (Tell 1982). At the end of two years, students in the intensive intervention schools reported significant decreases in fat consumption and, correspondingly, increases in consumption of complex carbohydrates. Males in the intervention schools also demonstrated increased levels of physical activity. With regard to drug abuse prevention, students in the intensive program had a lower smoking prevalence rate than students in control schools, according to students' self-reports (Tell, personal communication).

The International Know Your Body Program involved 17,150 students, ages 13-to-15, in fifteen countries. Each country designed its own within-country research project. (The North Karelia and Oslo Youth projects were, incidentally, part of the Know Your Body Program.) The interventions are conducted in schools. They consist of a general screening of health habits and risk factors, feedback to students on their risk profile via a Health Passport, and teacher-facilitated classroom activities in nutrition, smoking, drug use, and physical activity. At the end of one year, risk factor screening and student feedback was completed for all fifteen countries (Wynder et al. 1981). Results of the interventions in North Karelia and Oslo are reported above, although both projects added a smoking prevention intervention. Recent intervention activities in New York with fifth grade students in three school districts yielded lower fat consumption, increases in health knowledge, increases in fitness levels, and lower saliva thiocyanate levels (Arnold 1982). With regard to our concern with drug abuse prevention, very little can be concluded at the present time about the efficacy of the Know Your Body Program for reducing eventual drug use.

The Chicago Heart Health Curriculum Project involves interventions with sixth grade students in 34 classes in the Chicago Public Schools (Sunseri et al. 1982). Five sixth grade classes serve as controls. The intervention consists of fifteen sessions of a curriculum called "Body Power" and involves five health modules. The modules include anatomy and physiology, nutrition, physical activity, and risk reduction. One additional module is aimed at smoking. At the end of the first year of intervention, students reported increased knowledge in all five areas covered by the curriculum and improved attitudes toward nutrition as compared to students in the control classes. These effects were augmented by direct parental involvement in heart health classes. With regard to drug abuse prevention, students in the intervention program demonstrated less interest than control students in buying cigarettes; no effect on actual smoking behavior was reported.

Several other major health promotion programs currently underway are in the implementation stage, or their evaluations are not as yet completed. In Sweden and in Canada, for example, health promotion efforts include nation-wide campaigns to prevent adolescent cigarette smoking, and to minimize drinking and drug use. Both nations are using mass media and intensive, provincial, school-based interventions (Tibbin 1980). Other health promotion programs, such as the one in Galveston, do not include a focus on adolescent drug-related interventions.

CONCLUSIONS

Several generalizations can be made from this review of programs that emphasize health promotion. All of them give attention to health-enhancing as well as to health-compromising behavior. Characteristically, the attention to health-enhancement focuses on increased physical activity and healthy eating patterns. The attention to reducing health-compromising behavior has almost exclusively been focused on cigarette smoking, with hypertension as a secondary concern. Almost no attention has been given to the moderation of alcohol use or to diminution of illicit drug use such as marijuana. The domain of health that is implicated in these programs is, in almost every case, physical health. Finally, their main focus of intervention has been behavioral; secondary attention has been given to the environment, and personality has not received much attention at all in any of these programs.

Considering the number of programs reviewed, the magnitude of resources invested in them, and the scope and intensity of effort involved, it is unfortunately the case that little information can be gleaned from them about the *unique* efficacy of health promotion as an approach to adolescent drug abuse prevention. What has emerged from most of the studies is that adolescent cigarette smoking can be affected, either by delaying its onset or by reducing its prevalence. While this is an important outcome of the *overall* intervention approach, it is not possible to attribute that outcome to the promotion of health-enhancing behavior; rather, it seems to reflect primarily the very direct focus on reducing smoking behavior. Indeed, none of the research designs permits the disentangling of intervention components in a way that enables specific causal inference. It is clear, then, that an adequate test of health promotion and its two complementary strategies has not yet been accomplished.

Future research on health promotion as an approach to drug abuse prevention should, nevertheless, be able to benefit from the pioneering work accomplished by the programs we have described. It should also be able to benefit from the conceptual clarification that is now actively underway in the health promotion field (Kickbusch 1983). Already, however, there seems to be a sufficient basis for making a half-dozen general recommendations.

First, and not surprisingly, it seems time for adolescent health promotion interventions to be guided by and logically derived from a theoretical framework relevant to adolescent drug use and to adolescent development. The relative paucity of theoretical elaboration ought no longer to be acceptable given the size of investment generally involved.

Second, health promotion interventions should seek to implement, simultaneously, *both* complementary strategies: the introduction or strengthening of health-enhancing behavior and the elimination or weakening of health-compromising behavior. In this regard, research designs are needed that will permit the specification of the relative contribution of each strategy, and of their interaction.

Third, health promotion interventions need to encompass more than their customary focus on behavior alone. More attention to environmental change clearly seems to be warranted, including the larger environment of the social norms and social supports that regulate the occurrence of behavior, whether health-enhancing or health-compromising. Attention to changing personality attributes, both those proximal to specific health behaviors, such as value on fitness, and those more distal, such as a general sense of personal competence, seems long overdue as well.

Fourth, the level of behavior, itself, would seem to warrant more conceptually oriented research within health promotion programs for drug abuse prevention than there has been in the past. Recognition of the well-established co-variation among a number of health-compromising behaviors makes it essential to have interventions that focus on multiple behavior targets and are able to assess multiple behavioral outcomes. Further, knowledge is needed about the possible co-variation among health-enhancing behaviors as well, and about their relationship to health-compromising behavior. Research on the functions or meanings of the behaviors in both of these categories would permit much more sensitive efforts at interventions seeking to substitute less health-compromising behavioral alternatives that can serve similar psychological functions or have similar meanings for an adolescent.

Fifth, health promotion interventions would be strengthened by orienting them toward all of the health domains more explicitly, and including social and personal health. This suggests, at the very least, the promotion of opportunity for self-improvement through, for example, access to employment, education, and recreation, and the opportunity to explore potential aptitudes and undeveloped talents.

Finally, as these recommendations all seem to indicate, a salutary development in future health promotion interventions to prevent adolescent drug abuse would be an increase in more comprehensive programs that could rightfully claim that they are: "Doing The Cube."

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Comprehensive Community Programs for Drug Abuse Prevention: Implications of the Community Heart Disease Prevention Programs for Future Research

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and Julie Solis, M.S.W.

Prevention of cigarette smoking and alcohol and drug abuse in whole populations through community action may now be achievable. There are reasons to be optimistic. First, unhealthy lifestyles consist of behaviors which are acquired early in life through example and social reinforcement, these unhealthy behaviors are maintained through periodic social reinforcement, environmental cues, and in some cases physiological reinforcement. Second, research in smoking prevention, which has considered the role of social psychological factors in promoting the onset of cigarette smoking, has repeatedly demonstrated that relatively short interventions can reduce the incidence of cigarette smoking in young adolescents by one half or more, and that these effects can have sustained action (Johnson 1982a; Evans 1982; Perry 1983). Recent research has demonstrated that the same approaches can be useful for preventing the onset of alcohol and marijuana use (McAlister et al. 1982; Johnson in press; Botvin, this volume). The social psychological variables important to onset of alcohol, marijuana, and other drug use, and probably dietary practices and activity patterns as well are much the same as for cigarette smoking (Flay et al. 1983). Social psychological interventions to countermand these negative influences have also been reviewed elsewhere (Johnson 1982b; McAlister, this volume). Briefly, important social psychological determinants of acquisition and maintenance of drug use and other unhealthy practices include: vicarious learning from observing the behavior of others (role models), consensual validation of specific behavior, perceptual errors regarding behavioral norms, attributional errors about causation or responsibility, social reinforcement, social and environmental cues which trigger specific behaviors, perception of behavioral options and self-efficacy regarding these options, and effectiveness of preferred behavioral options in achieving valued outcomes. Successful intervention programs are those which have taken into account at least some of these social psychological and behavioral variables and taught cognitive and behavioral skills useful in resisting social and environmental influences to smoke, use drugs, and engage in other unhealthy practices. These intervention strategies have tended to focus on youth who by and large have not yet acquired the lifestyle patterns targeted for prevention and, largely out of convenience, have been implemented through the schools.

THE CASE FOR COMPREHENSIVE COMMUNITY PREVENTION PROGRAMS

There are several reasons why sustained, highly integrated, multi-component community programs should be preferable to single component programs or campaigns. Despite successful developments in social psychologically and behaviorally based school programs in substance use prevention, the potential of any solely school-based program is severely limited by a number of factors.

- The majority of a youth's day is spent outside of school. Even in school, attention to drug abuse prevention consumes only a small amount of curriculum time. In addition, most drug use occurs outside of school.

- The major portion of a young adolescent's time is still spent in the home (as much as 17 hours per day, more on weekends) and in front of the television set (four to six hours on the average per day). The potential influences of family and mass media are enormous.

- Substantial time is spent by the young person in predictable out-of-school locations, such as diners, movie theaters, and video arcades. These could be sources of considerable positive influence instead of negative influence on drug use.

- The young people at highest risk to drug use onset are the least likely to be at school on the days that prevention programs are delivered. Absenteeism and dropout rates are known to be highest among drug users.

- Significant onset of drug and alcohol abuse also occurs at other identifiable times beyond the school years, e.g., adulthood and late adulthood.

For these reasons, an optimal prevention program would utilize not only school systems for delivery, but also families, mass media, and community organization. Any such program should be comprehensive and highly integrated, with each component contributing according to its unique potential. Every intervention component should be soundly based on theory and research findings.

Little is known, however, about how to apply the principles of behavioral change developed in school-based prevention research to other community settings, and about which community components can contribute most effectively and in what combination, to prevention. Research in these matters is needed. Recent research in community programs for heart disease prevention provides important clues about how research for community drug abuse prevention might best be carried out. The findings from these heart programs are reviewed in the pages that follow and their implications for community drug abuse prevention research are discussed.

COMMUNITY PROGRAMS FOR HEART DISEASE PREVENTION

In recent years community programs for heart disease prevention have been developed and tested in the United States and elsewhere. The lessons from community heart disease prevention are relevant to drug abuse prevention in several important ways: 1) many of the behavioral objectives are the same, 2) problems in community organization are similar, 3) the same general strategies for community stratification and assignment to experimental conditions are appropriate to both kinds of programs, 4) many of the measurement problems and their solutions are the same, and 5) the scope of both types of programs is similarly large and demanding in terms of organizational requirements.

At the same time there are ways that community drug abuse prevention programs ought to differ from the heart disease prevention programs conducted to date. First, the primary target group for the heart programs has been middle-aged adults (ages 30-59), especially males. This age group would also be targeted in an optimum drug abuse prevention program, both to prevent onset of abuse in mid and later life (a substantial problem), and to reach young people more effectively through their parents, adult role models, and gatekeepers of community resources. However, the primary target group of a community drug abuse prevention program probably should be youth, ages 10-17 approximately. Recent community heart health programs have had substantial youth components, some of which have been quite successful - most notably the school-based smoking prevention programs. Still, these have been either secondary programs or attached only loosely to the heart programs, rendering them somewhat different from the optimum drug abuse prevention strategy.

A second difference between drug abuse prevention programs and heart programs is their different outcome objectives. The heart programs have been preoccupied - understandably so - with heart disease mortality and morbidity, and biological risk factors for heart disease. Drug abuse prevention programs by comparison are concerned with the direct effects of interventions on behavior. The biological and social sequelae (e.g., reduced incidence of cirrhosis of the liver and poor school performance) would be important secondary outcomes. However, drug abuse prevention programs should be considered as successful or not primarily in terms of their impact on the behaviors targeted, i.e., use and abuse of specific substances in the population.

A third difference is that the emphasis on drug abuse prevention should be on preventing onset of abuse in youth, rather than trying to bring about changes in well developed lifelong patterns of behavior (i.e., smoking, dietary practices, sedentary lifestyles, etc.). Research in cigarette smoking would suggest that prevention of smoking is far easier and more cost effective than programs for cessation. As has been the case with heart health programs targeted largely at adults, drug abuse prevention programs might well contain behavior change components for older audiences, but the greatest impact will probably come through primary prevention of abuse in youth.

A fourth difference is that heart health programs have typically utilized existing medical resources in the community. Many drug abuse prevention programs would probably rely less heavily on medical resources, and take advantage of existing community resources that are already concerned with drug abuse. Generally the involvement of physicians, nurses, pharmacists, etc., in these organizations is minimal. This potential difference should not minimize the potential, however, of a public health approach to drug abuse prevention wherein avoidance of drug abuse is considered as an important element of healthy living. This approach could be very appealing.

Fifth, the measurement requirements of the two types of programs might be quite different. Drug abuse prevention programs might not require the extensive anthropomorphic measures called for in heart health programs. At the same time, the measurement of drug abuse is probably somewhat more socially sensitive than the measurement of heart health, creating other assessment problems.

With these differences in mind, it is useful to consider what behavioral changes the community heart programs have accomplished, how these accomplishments were brought about, and their relevance to drug abuse prevention.

Four community programs for heart disease prevention are reviewed here. These programs include: The Multi-Risk Factor Intervention Trial (MRFIT). The Oslo study, the Stanford Three Community Study, and the North Karelia Project in Finland. They vary in a number of ways, including the populations targeted for intervention; intensity and duration of the programs; the specific behavioral, biological, and disease objectives, and the number of those objectives; community channels through which programs were implemented; strategies for community organization; social and psychological models guiding program implementation; and program outcomes reported. Different community programs for heart disease prevention have emphasized different features in their plans and reports. Hence, equally complete information is not available about all components from all of the programs. Nevertheless, much can be learned from careful consideration of these programs for community drug abuse prevention.

The Multi-Risk Factor Intervention Trial (MRFIT)

Although not a comprehensive community study, MRFIT (Sherwin et al. 1981; Benfari 1981; Caggiula et al. 1981; Hughes et al. 1981; Cohen et al. 1981; Multiple Risk Factor Intervention Trial Research Group 1982) is important to consider because it represents the largest study ever reported of efforts to change the smoking and dietary behaviors of a specified population. Several features of MRFIT should be made clear in order to understand which features of the study and its outcomes are relevant to primary prevention of drug abuse. First, the study emphasized the effects of interventions on mortality and morbidity. Secondary emphasis was on the calculated risk of cardiovascular disease (the Framingham risk function or the Keyes equation). Behavioral outcomes have been of only tertiary importance in reports of the program's successes and failures to date.

Second, MRFIT included for study only persons at high risk of coronary heart disease. Criteria for inclusion were: male, ages 35-59, and having one or more of three risk factors - a mean baseline diastolic blood pressure greater than 95/140 mm Hg, a serum cholesterol level greater than 220, and cigarette smoking.

Third, the intermediate goals of MRFIT were to change behavior (stop or reduce smoking, cut back on intake of animal fats, etc.), not to prevent behavior, as is the case for drug abuse prevention.

Fourth, MRFIT would not qualify as a community study in any sense directly relevant to drug abuse prevention. There was no attempt to work through existing community resources such as schools, churches, community organizations, media, etc., except for the purpose of recruiting participants. Still, it did become a community event of some magnitude and as such received at least the implicit sanction of 27 host communities. Recruitment was from the general community and eligible individuals were assigned randomly to receive the program. These were components of the program that were highly relevant to community prevention, including involvement of whole families in the secondary prevention efforts.

With these restrictions in mind, it is worthwhile to consider the objectives, interventions, and outcomes of MRFIT for their implications for community drug abuse prevention research. The program may be described briefly as follows. From 1974 to 1976, 361,662 men were screened at 27 centers, and 12,886 were found to meet acceptance criteria. Those selected were assigned randomly to either a special intervention (SI) or a usual care control (UC) group. A program of interventions was designed for the SI group to reduce three cardiovascular risk factors: smoking, hypertension, and hypercholesterolemia. The UC group members were referred to their ongoing sources of care for traditional treatment. All participants were followed for at least six years and an average of seven, or until death for those dying during the study.

The special intervention program was designed to reduce risk by sequentially increasing awareness, bringing about behavior changes, and eventually effecting risk factor changes. Immediately after randomization to the SI group, study physicians delivered simple messages regarding nutrition and weight as appropriate to the participants. Smokers were counseled more extensively regarding cessation by a study physician. Involvement of the participant's wife or homemaker in the intervention program was also solicited at this time.

Within 3 to 5 weeks after randomization, a 10-week group intervention program for the simultaneous modification of all three risk factors was initiated. Approximately 10 men were assigned to each group in order of recruitment. The group met on a weekly basis for 1 1/2 to 2 hours per session. The integrated group intervention program presented the current state of knowledge regarding the three risk factors. Principles of behavior modification were applied to bring about dietary changes, the cessation of smoking, and adherence to antihypertensive medication. The initial sessions included audiovisual and printed materials to enhance awareness. Subsequent group sessions focused on activities directed to the participant and his partner for initiating and sustaining behavior change. The group method was the usual mode of intensive intervention, although a small number of participants opted for an individualized approach. The wives of about three-quarters of the married participants attended at least some of the group sessions. The last session of the intensive group program usually occurred at the time of the first four-month followup visit.

Upon completion of the group program, participants who had reduced one or more risk factors were placed on a maintenance program. The general approach to maintenance in all three risk factor areas was individual counseling, planned and executed by an intervention team. Exceptions included the use of a stepped-care system for monitoring hypertensives and the development of group modalities for the smokers at some sites. Participants in the SI groups were seen at least every four months for intervention purposes. The process varied considerably across the different implementation centers.

Most relevant to considerations for future research in drug abuse prevention is the finding, validated by biochemical analyses, that cigarette smoking was significantly affected by the interventions. Figure 1 reveals that the proportion of men reporting cigarette smoking fell steadily in both groups over the six years. The decrease was more abrupt, however, in the first year for those in the treatment group, and differences remained significant for all six years. Adjusting estimates of proportions of those who smoked by serum and plasma thiocyanate determinations revealed a similar pattern of results (Figure 2). Differences between the two groups remained highly significant. By self-report, 43% of smokers in the SI group had quit by one year, and 50% by six years. This compared to 14% at one year and 29% at two years for controls. Estimates corrected by thiocyanate determinations were 31% at one year and 46% at six years for those in the SI group, and 12% and 29% for those in the UC group. The smoking cessation program was clearly successful. Six-year differences

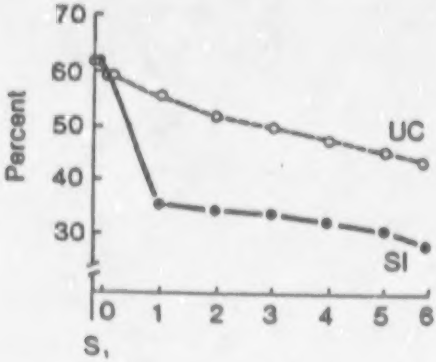


Figure 1. - Self-reports of cigarette smoking by year of follow-up in the MRFIT trials. Multiple Risk Factor Intervention Research Group. Multiple Risk Factor Intervention Trial, Risk Factor Changes and Mortality Results. Journal of the American Medical Association, 248(12):1465-1477, 1982. © 1982, The American Medical Association. Reprinted by permission.

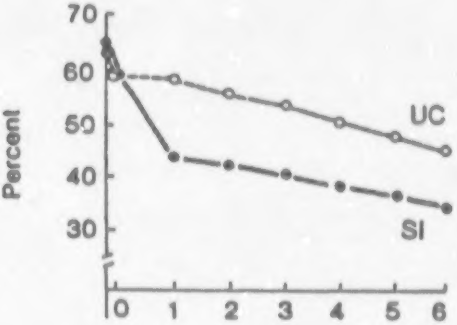


Figure 2. - Thiocyanate-adjusted reports of cigarette smoking by year of follow-up in the MRFIT trials. Multiple Risk Factor Intervention Research Group. Multiple Risk Factor Intervention Trial, Risk Factor Changes and Mortality Results. Journal of the American Medical Association, 248(12):1465-1477, 1982. © 1982, The American Medical Association. Reprinted by permission.

between treatment and control groups were considerably better than program objectives, according to both self-report and thiocyanate criteria.

Cigarette smoking is a behavior that should be targeted in any drug abuse prevention program because tobacco is believed to have great addictive potential, because smoking is the single behavior with the most adverse consequences for public health, and because smoking is closely associated with other drug use. The smoking results from MRFIT are most encouraging and are consistent with other data in indicating that smoking can be effectively controlled with good behavioral and social psychological programs.

Other findings from MRFIT that are also relevant for drug abuse prevention are those for dietary practices. Although dietary practices might not necessarily be a part of any drug abuse prevention campaign, they are conceptually relevant since diet represents deeply ingrained habits and preferences. At this writing, six-year followup data on dietary practices have not yet been published. However, data for dietary sequelae which are considered risk factors, serum cholesterol and blood pressure, are available. At six-year followup, treatment effects on those outcomes were significant (p<.01, See Figures 3 and 4). Mean serum cholesterol and blood pressure levels were significantly less in the treatment group from the one-year followup on. At this time, dietary results have been published for three- and four-year followup in the SI group,but not the UC group. Measured by 24-hour dietary recall, the proportion of total caloric intake through saturated fats was reduced 28% by the third year. Total dietary cholesterol was reduced 42%, and polyunsaturated fats in the diet were increased 36%. All of these accomplishments met the program's published dietary objectives. In addition, there was a small decrease in alcohol intake reported (reduction of alcohol intake was suggested to participants as a means for reducing total caloric intake). Individual changes in serum cholesterol levels and body weight support the validity of these self-report measures.

The mortality and morbidity results of the trial are equivocal. It is not clear from these results that interventions so late in the arteriosclerotic process (age 35-59) can have meaningful effects on mortality and morbidity. Resultant mortality from coronary heart disease and cerebrovascular disease was somewhat lower in the SI group than the UC group (4.7% and 7.1% respectively), but those differences were not significant. Cardiovascular mortality rates in both groups were considerably lower than expected from

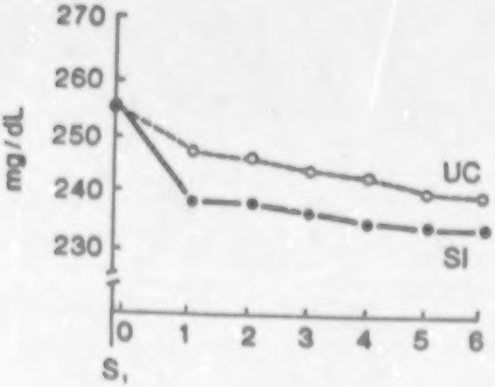


Figure 3. - Mean serum cholesterol levels by year of follow-up in the MRFIT trials. Multiple Risk Factor Intervention Research Group. Multiple Risk Factor Intervention Trial, Risk Factor Changes and Mortality Results. Journal of the American Medical Association, 248(12):1465-1477, 1982. © 1982, The American Medical Association. Reprinted by permission.

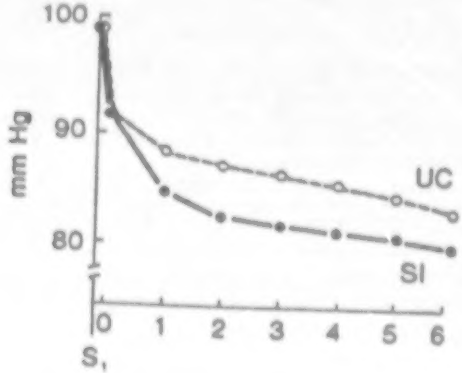


Figure 4. - Mean diastolic blood pressure by year of follow-up in the MRFIT trials. Multiple Risk Factor Intervention Research Group. Multiple Risk Factor Intervention Trial, Risk Factor Changes and Mortality Results. Journal of the American Medical Association, 248(12):1465-1477, 1982. © 1982, The American Medical Association. Reprinted by permission.

base-line risk factors. In addition, there was an unanticipated reduction in all risk factors in the control group, although they were exceeded in the treatment group. Because of the unexpected reduction of risk factors in the control group, differences between the groups on blood pressure and serum cholesterol - while significant - fell short of program objectives.

It is not relevant to the discussion why the behavioral changes observed and total risk factor reduction achieved in the MRFIT trials have not yet resulted in significant reduction in cardiovascular mortality. It is important, however, to note that the behavioral objectives of the program were all met successfully. Substantial reduction in cigarette smoking and considerable changes in dietary practices were achieved despite the fact that these must have been deeply ingrained practices for this middle-aged population. The methods used in bringing about those changes should be examined carefully by drug abuse prevention researchers for their potential relevance to drug abuse prevention research.

The Oslo Study

The Oslo Study (Leren et al. 1975; Holme et al. 1980; Hjermann et al. 1981; Holme et al. 1981a,b; Holme et al. 1982) was an experimental epidemiological study of the effects of informative advice on the dietary and smoking habits of healthy, middle-aged men at high risk of coronary heart disease, and the effects of these interventions on mortality and morbidity. All men aged 40-49 were invited for screening of coronary risk factors at the Oslo Department of Health during 1972-73. A response rate of 65% was achieved. Of 16,202 men screened, 1,232 men who manifested the primary risk factors (e.g., smoking, hypertension, etc.) were selected and randomly assigned to the intervention group or the control group. The participants were followed for a five-year period to assess the effect of the intervention program on the lowering of serum lipids, the cessation of smoking and the subsequent reduction of coronary heart disease incidence.

The intervention program consisted of advice given in individual and group formats. Initially, 10 to 15 minutes were spent in one-to-one discussions of the risk factor concept and the purpose of the study. Another 30 minutes were spent in delivering individualized dietary advice based on the person's body weight, serum cholesterol and triglyceride levels, and his general background. Anti-smoking advice was also given individually to all the smokers. The wives of the program participants were invited to groups with their husbands for diet and smoking counseling information. The groups ranged in size from 30 to 40 people. Follow ups regarding eating and smoking habits were conducted every six months in the intervention group and every 12 months in the control group. Only 14 intervention group subjects and three control group subjects were lost during the course of the study, due to refusal or relocation.

The Oslo study is conceptually very similar to MRFIT and the same comments regarding the relevance of program outcomes, participant population, specific behaviors targeted, etc., apply here.

Cigarette consumption (mean number of cigarettes per day) declined significantly more in the intervention condition than the control condition, and the difference was maintained for the five years (see Figure 5). Cholesterol and triglycerides, presumably determined in part by dietary practices, also decreased more for those in the intervention condition (Figures 6 & 7). Although measures of diet were taken, those results have not been reported to date.

Figure 8 reveals that despite the smaller N when compared to MRFIT, program effects were found for coronary heart disease mortality and morbidity combined. After four years the incidence of fatal and non-fatal myocardial infarctions and sudden death combined was less in the intervention condition than the control condition ($p<.03$).

The Oslo study corroborates the findings from MRFIT that cigarette consumption can be reduced in middle aged men and, in this case, with relatively minimal intervention. Although the relationship between triglycerides and dietary intake was not reported for the Oslo study, the finding of reduced triglyceride levels in the intervention group following dietary recommendations suggests that meaningful behavioral changes may have been accomplished there as well.

The Stanford Three Community Study

The Stanford Three Community Study (Meyer and Henderson 1974; Maccoby 1976; Stern et al. 1976; Farquhar et al. 1977; Maccoby et al. 1977; Farquhar 1978; Maccoby and Alexander 1979, 1980; Meyer et al. 1980a; Maccoby and Solomon 1981; Farquhar et al. 1981; Solomon 1982) made several important advances in community prevention research. Unlike MRFIT and the Oslo Heart Study where middle-aged men at high risk of coronary heart disease were targeted for interventions through medical clinics, the Three Community Study targeted the general public

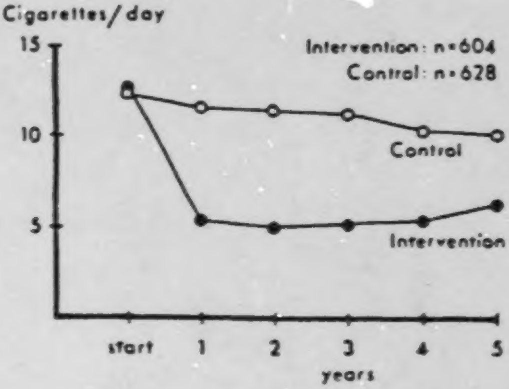


Figure 5. - Intervention effects on smoking in the Oslo Study. I. Hjermann, I. Holme, K. Velve Byre, P. Leren. Effect of Diet and Smoking Intervention on the Incidence of Coronary Heart Disease. Report from the Oslo Study Group of a Randomised Trial in Healthy Men. The Lancet, December 12, 1981, pp. 1303-1309. © 1981, The Lancet Ltd. Reprinted by permission.

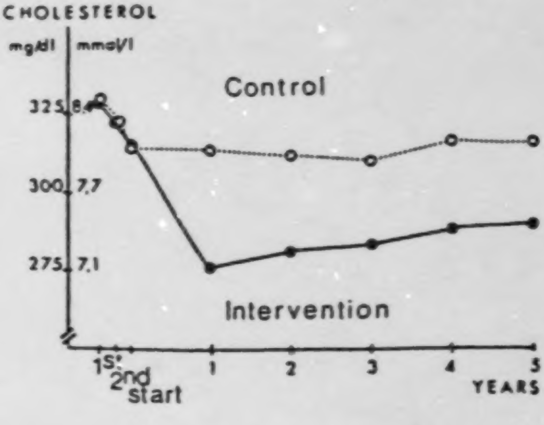


Figure 6. - Intervention effects on serum cholesterol in the Oslo Study. I. Hjermann, I. Holme, K. Velve Byre, P. Leren. Effect of Diet and Smoking Intervention on the Incidence of Coronary Heart Disease. Report from the Oslo Study Group of a Randomised Trial in Healthy Men. The Lancet, December 12, 1981, pp. 1303-1309. © 1981, The Lancet Ltd. Reprinted by permission.

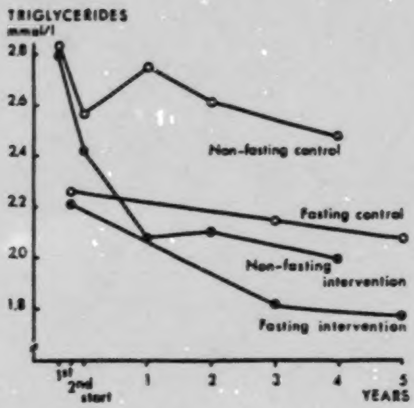
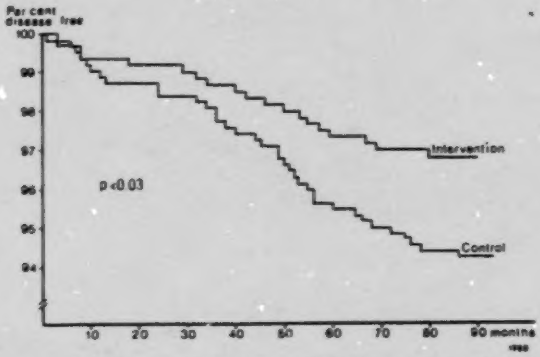


Figure 7. - Intervention effects on triglycerides in the Oslo Study. I. Hjermann, I. Holme, K. Velve Byre, P. Leren. Effect of Diet and Smoking Intervention on the Incidence of Coronary Heart Disease. Report from the Oslo Study Group of a Randomised Trial in Healthy Men. The Lancet, December 12, 1981, pp. 1303-1309. © 1981, The Lancet Ltd. Reprinted by permission.



Life table analysis of CHD (fatal and non-fatal myocardial infarction and sudden death) in intervention and control groups.

Figure 8. - Life table analysis of CHD in intervention and control groups in the Oslo study. I. Hjermann, I. Holme, K. Velve Byre, P. Leren. Effect of Diet and Smoking Intervention on the Incidence of Coronary Heart Disease. Report from the Oslo Study Group of a Randomised Trial in Healthy Men. The Lancet, December 12, 1981, pp. 1303-1309. © 1981, The Lancet Ltd. Reprinted by permission.

for intervention via mass media. However, measures were collected only from persons 35-59 years old. Males and females were equally represented in the sample. Media and individual interventions differed from the previous heart studies in being well grounded in theory and research findings from the behavioral sciences.

Media campaigns and evaluations were designed with five elements or objectives in mind: *agenda-setting* - drawing the public's attention to the campaign issues; *informing* - providing to the recipient a logical set of propositions that make the issues relevant and set the stage for action; *motivating* - providing positive incentives for behavior change; *training* - teaching skills in how to modify risk behaviors and how to deal with barriers and personal costs; and promoting *self-maintenance* - providing skills relevant to maintenance, and environmental cues to support maintenance of behavior changes.

Two intervention towns (Gilroy and Watsonville) and a measurement-only control town (Tracy) were chosen on the basis of demographic comparability, the absence of major health education programs, reasonable proximity to Stanford, and the sharing of radio and television channels by Watsonville and Gilroy, but not by Tracy. The Three Community Study conducted a multimedia campaign from 1972 to 1975 in two of the California communities (Gilroy and Watsonville). In Watsonville the media campaign was supplemented with an intensive instruction program for high risk subjects. This previously untested combination of intervention approaches was designed to achieve maintained reduction of coronary heart disease risk factors through the simultaneous modification of smoking, exercise, and dietary behavior.

Probability samples of 500 persons between the ages of 35 and 59 were drawn from each community's approximate population of 15,000. The high-risk cohort was obtained by selecting the top quartile of those at risk at baseline in each town sample. In Watsonville, the 169 high-risk subjects were assigned randomly to either an intensive face-to-face instruction program (n=113), or to the media-only campaign (n=56). High risk groups in the media-only town (Gilroy) and the control town (Tracy) served as comparison groups for the intensive intervention town (Watsonville).

The media campaigns in Gilroy and Watsonville focused on providing knowledge and skills to enable behavior changes. Media intervention began two months after the baseline survey. Over the three-year period, there were more than 150 radio and television spots, over 3 hours of radio and television programming, weekly newspaper columns, advertisements, and material mailed to persons in the random samples. A bilingual campaign was implemented in areas with sizeable Spanish-speaking populations. The campaign was conducted intensively for the first two years with a shift in emphasis to maintenance activities in year two. The intensity of the campaign was considerably reduced in year three.

The face-to-face instruction program was initiated through invitations mailed to the randomly selected Watsonville subjects and their spouses to attend a recruitment consultation. Ninety-five percent of the subjects (107 of 113) and virtually all of the spouses agreed to participate. Fifty-nine percent (63 subjects) chose to join one of four instruction groups; the remaining 41% (44 subjects) preferred individual treatment sessions at home. Due to death, out-migration, and dropout, about one-third of the high-risk participants were lost to followup (77 of the 107 subjects remained by the end of year two).

The face-to-face instruction program incorporated techniques derived from social learning theory and behavioral self-control principles. These included self-monitoring, modeling, and a token reward system to simultaneously affect diet, smoking, and physical activity. The dietary interventions included having participants keep a record of food consumed on a menu plan for the first four weeks of instruction. Appropriate meal preparation and food storage were modeled live and via videotape. Points were awarded for success with eight out of 10 recommended dietary improvements.

Treatment procedures in smoking cessation consisted of activities designed to identify and change the antecedents of smoking. Goal-setting for the gradual or complete reduction of smoking over a five-week period was instituted. Similarly, prescribed physical activity levels were self-monitored and supplemented by suggestions. Points were assigned for weight loss of one pound or more. Group progress on diet and physical activity was charted on a wall graph.

To enhance maintenance of new behaviors, fading of instructional support began after the sixth session in both the group and home programs. The token reward system was eliminated, and the self-monitoring and modeling procedures became less complex. Time intervals between group sessions were increased from one week to two or three weeks. Gradual reductions in instruction time occurred. Instruction shifted from a modeling and reinforcement focus to problem-solving regarding maintenance.

The intensity and duration of the face-to-face interventions were as follows. The four instruction groups each met nine times from 1 1/2 to 3 1/2 hours per session over a 2 1/2 month period in community settings. Group size ranged from 24 to 28 subjects and spouses. During the same period project counselors made eight home visits, each from 1 to 1 1/2 hours in length, to each participant. Smokers in the home program received five or six additional visits by smoking cessation counselors. During the second year, the intensity of the home and group programs gradually diminished to virtually no activity by the third year. Near the end of the third year, letters were sent to all the media and intensive instruction participants, concluding with small gatherings in subjects' homes.

Results from the Three Community Study have been reported for total risk reduction, specific risk-factor reduction, and targeted behavioral changes. Figure 9 reveals changes in total risk from baseline over the three-year period. Risk reduction was greatest and best maintained in the Watsonville intensive instruction condition. At three years, risk reduction was greater among Watsonville intensive intervention subjects than Tracy control and Gilroy media-only subjects. It may be that Watsonville media-only subjects benefited by association with those who received intensive instruction; evaluations indicate that there were high levels of communication about prevention between these two groups of Watsonville residents. Figure 10 shows that knowledge gains over the three-year period roughly mirrored risk reduction. The least gain occurred in the Tracy control condition; intermediate gains occurred in the two media-only conditions; and the greatest gain occurred in the intensive instruction condition.

The most dramatic result, and the one most relevant to drug abuse prevention, was sustained reduction in cigarette smoking in the Watsonville intensive intervention group. Reductions in smoking were significantly greater for the Watsonville intensive intervention group than for any other group at all but the first followup measures (Figure 11). The Watsonville intensive intervention group experienced a 50% cessation rate and a 51% reduction in cigarettes smoked per day. If intensive instruction participants lost to followup are included in the analysis and assumed to have continued as smokers, the three-year followup cessation rate was still 32%. These findings are highly consistent with those for MRFIT and the Oslo study.

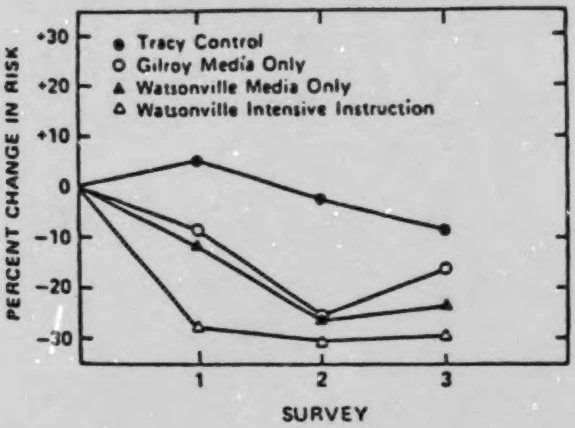


Figure 9. - Percentage of change from baseline (0) in risk of cardiovascular disease after the three annual follow-up surveys: The Stanford Three-Community Study.

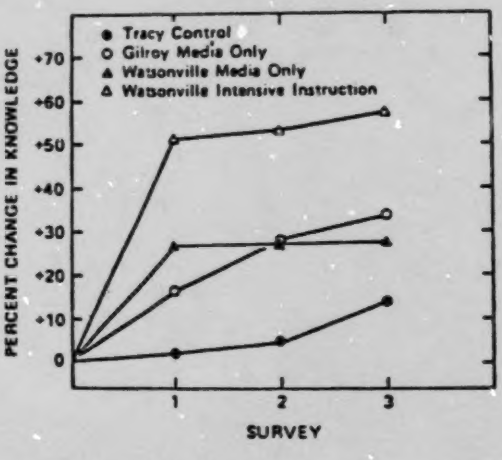


Figure 10. - Percentage of change from baseline (0) in knowledge of cardiovascular disease risk factors at three annual follow-up surveys: The Stanford Three-Community Study.

Figures 9 and 10: A.J. Meyer, J.D. Nash, A.L. McAlister, N. Maccoby, and J.W. Farquhar. Stanford Heart Disease Prevention Program, Stanford University School of Medicine. Skills Training in a Cardiovascular Health Education Campaign. Journal of Consulting and Clinical Psychology, 48(2):129-142, 1980. ©1980, The American Psychological Association, Inc. Reprinted by permission.

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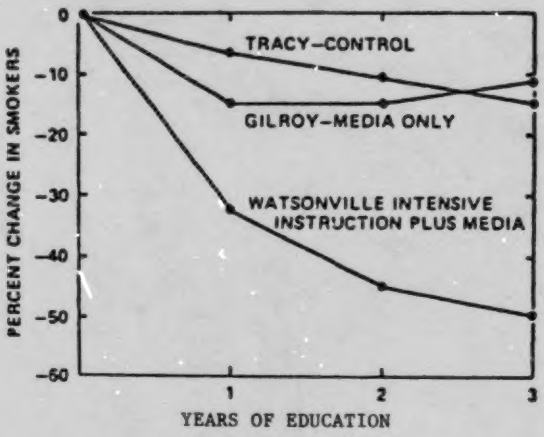


Figure 11. - Comparison of cessation rates among smokers in communities subjected to varied intensity of education: The Stanford Three Community Study. John W. Farquhar, Paul F. Magnus, Nathan Maccoby. The Role of Public Information and Education in Cigarette Smoking Controls. Canadian Journal of Public Health, 72:412-420, 1981. © 1981, The Canadian Public Health Association. Reprinted by permission.

Next to smoking, the most relevant findings for drug abuse prevention were the dietary modifications. Table 1 reveals that both media-only groups achieved significantly greater reduction in dietary cholesterol intake than did Tracy controls. Dietary change in the Watsonville intensive instruction condition was consistently greater than for the other conditions, but significantly so only for the first followup comparison with Watsonville media-only subjects. Reductions in dietary saturated fat for all three treatment groups were significantly greater than those for Tracy controls throughout the study, except for the Watsonville media-only group which began to differ from controls only at the third followup. No effects were realized for changes in activity levels.

Biological outcomes are one step removed from behavioral changes. However, they are useful as validators of behavior change as can be seen in Table 2, changes in plasma cholesterol levels were significantly greater for the Watsonville intensive intervention group than the Tracy control cohort at all three followup surveys. Reductions in plasma cholesterol were greater for the Watsonville media-only group than for the Tracy group at the first and second followups, and were greater for Gilroy than for Tracy at the second followup only. Apparently, media effects on plasma cholesterol were difficult to maintain. Changes in plasma triglycerides were similar to those for plasma cholesterol levels. Changes in systolic blood pressure were significant for all three treatment cohorts when compared to the Tracy controls at all three followup surveys (Table 3), and all cohorts except Gilroy media-only manifested a reduction in diastolic blood pressure. The difference in systolic blood pressure between the Watsonville intensive instruction group and the Gilroy media-only group was significant at all three followup measures.

Evaluations of the Stanford Three Community Study present a consistent pattern of results that support the feasibility of well-designed media and family-oriented intensive intervention for risk-reducing behavior change. The results for behaviors most relevant to drug abuse prevention were particularly impressive; sizeable effects were achieved and maintained for three years on cigarette smoking cessation and dietary practices. Serum cholesterol and triglyceride changes support the reported changes in dietary behavior. Significant and sustained changes in blood pressure are particularly interesting in this study, since the primary recommendations for changes in media campaigns were salt restriction, weight reduction, and exercise. Since no lasting effects were found for weight reduction and

	Treatment			
Measurement	Watsonville intensive instruction	Watsonville media only	Gilroy media only	Tracy control
	Diet			
Dietary cholesterol (mg/day)				
Baseline	460.9	492.4	607.2	510.7
Follow-up 1	−40.7	−26.1	−29.8	−10.1
Follow-up 2	−37.1	−22.9	−31.8	−6.5
Follow-up 3	−42.3	−27.2	−38.6	−13.4
Dietary saturated fat (g/day)				
Baseline	33.4	36.1	40.8	34.5
Follow-up 1	−33.4	−20.9	−25.8	−11.1
Follow-up 2	−30.5	−17.0	−30.1	−5.1
Follow-up 3	−36.4	−23.9	−38.4	−7.0

Table 1. - Mean Values at Baseline and Percentage of Change from Baseline at Three Follow-Up Surveys for Dietary Cholesterol and Saturated Fat: Stanford Three Community Study. Anthony J. Meyer, Joyce D. Nash, Alfred J. McAlister, Nathan Maccoby, and John W. Farquhar. Stanford Heart Disease Prevention Program, Stanford University School of Medicine. Skills Training in a Cardiovascular Health Education Campaign. Journal of Consulting and Clinical Psychology, 48(2):129-142, 1980. © 1980, The American Psychological Association, Inc. Reprinted by permission.

	Treatment			
Measurement	Watsonville intensive instruction	Watsonville media only	Gilroy media only	Tracy control
	Overall physiologic indicators			
Plasma cholesterol (mg/100 ml)				
Baseline	233.9	235.6	238.4	232.5
Follow-up 1	−5.3	−3.6	−.6	1.5
Follow-up 2	−1.5	−1.7	−1.8	3.0
Follow-up 3	−3.1	−.2	.1	2.3
Plasma triglyceride (mg/100 ml)				
Baseline	180.7	182.8	174.5	139.6
Follow-up 1	−9.5	−7.1[b]	2.8	17.6
Follow-up 2	−6.4	3.9	−9.8	6.4
Follow-up 3	−17.4	−3.4	−1.8	−3.2

Table 2. - Mean Values at Baseline and Percentage of Change from Baseline at Three Follow-Up Surveys for Plasma Cholesterol and Triglycerides: Stanford Three Community Study. Anthony J. Meyer, Joyce D. Nash, Alfred L. McAlister, Nathan Maccoby, and John W. Farquhar. Stanford Heart Disease Prevention Program, Stanford University school of Medicine. Skills Training in a Cardiovascular Health Education Campaign. Journal of Consulting and Clinical Psychology, 48(2):129-142, 1980. © 1980, The American Psychological Association, Inc. Reprinted by permission.

exercise, the blood pressure effects achieved in the general population may have been due largely to restrictions in salt intake. Data directly related to this point have not yet been reported. No data are available from the Three Community Study on changes in actual mortality and morbidity rates.

Leventhal and his colleagues (1980) in their critique of the Stanford Three Community Study have made a number of conceptual and design suggestions which should be useful for future community drug abuse prevention research. Another published critique by Kasl (1980) is also very useful. In light of recent publications by the Stanford group (Meyer et al. 1980a), including direct responses to the Leventhal et al. and Kasl critiques (Meyer et al. 1980b), these useful commentaries would not appear to diminish the importance of this study. It is especially important, however, that drug abuse prevention researchers pay heed to Leventhal et al.'s recommendation to consider community components for their individual effects and to focus carefully on behavioral outcomes, and to Kasl's recommendations about exploring covariate relationships between reported behaviors and biological changes. The Stanford Three Community Study was the first to assess, albeit quasi-experimentally, differential effects of media and face-to-face interventions. To their credit they have taken care to report relevant behavioral outcomes.

The North Karelia Project

The North Karelia Project (Salonen et al. 1979; Puska et al. 1979 and 1981a,b,c,d; McAlister et al. 1980, 1982) was the first comprehensive community program for heart disease prevention conducted on a large scale and with adequate data collected to evaluate program effects. In addition to the mass media and individual instruction approaches used in the Stanford Three Community Study, the North Karelia Project included restructuring the health delivery system, community organization, interventions into the workplace and shopping place, school-based programs for youth, and a variety of consumer training programs available for all persons in the community, not just those at high risk. The North Karelia Project differed from those before it in not singling out persons at high risk for particular attention. The appeal was to the general public to bring about constructive behavioral changes.

Unlike the Stanford study, intervention strategies and their coordination were not based on a clearly articulated theoretical framework. Nor were they obviously guided by data from the behavioral sciences. Instead, the various components of the program seem to have been developed piecemeal depending on interests of various segments of the community. In fairness, it should be pointed out that late in the program, behavioral scientists from the United States and elsewhere were brought in to help design specific school and media programs.

Like most other heart disease prevention programs, primary emphasis in the North Karelia Project has been on evaluating disease outcomes, secondary emphasis has been on changes in risk factors. Very little in the way of systematic evaluation of behavior and behavior change has been reported.

The North Karelia Project was conceived as a prevention service program, somewhat of an emergency program, called for by local Finnish inhabitants and politicians in the face of an epidemic of cardiovascular mortality and morbidity in the region. Growing local concern regarding the county's exceptionally high cardiovascular disease rates triggered this monumental effort between 1972 and 1977 to reduce the levels of the major coronary heart disease risk factors. The North Karelia Project was not conceived as a research project and, hence, evaluation has suffered somewhat. The effect of the program was assessed through comparison with a reference county, Kuopia, which matched North Karelia's mortality and morbidity rates and socioeconomic characteristics. Despite its limitations as a controlled study, the North Karelia Project is the best example to date of a comprehensive community intervention study for which outcome data are available.

The major elements of the intervention included individual and group services, general health education, training, community organization, and environmental changes. During the five-year period, the project organized 17 seminars for physicians and 22 seminars for public health nurses and other health personnel, with an average attendance of 50 persons per seminar. Buttressed by media and community organization efforts, the proportion of male hypertensives under appropriate treatment in North Karelia increased from 13% in 1972 to 45% in 1977.

Information campaigns regarding the coronary heart disease risk factors were successful in attracting high levels of support from the news media in the region. Over the project period, local newspapers printed 1,509 articles related to coronary heart disease risk factors, their management, and program activities. Over one-half million bulletins, posters, and other educational materials were distributed. About 250 general meetings reaching over 20,000 community members were held in work, school, and community settings. As a result, North Karelians showed a 10% to 15% increase in knowledge and understanding of coronary heart disease risk factors.

A variety of consumer training programs was also implemented. A cooking course which incorporated involvement of the whole family was conducted in conjunction with a local housewives' association. Three hundred forty-four sessions of "Parties for a Long Life" were held, with about 15,000 participants. At the 1976 followup survey, 18% of the women and 9% of the men had been involved at least once in the activity. Smoking cessation classes were also held, culminating in a comprehensive smoking cessation program televised nationally in 1978. The four-week televised program consisted of seven, 45-minute, sessions with a studio group of ten smokers.

Community organization included activities for mobilizing the support of opinion leaders and informal social networks. The support of prestigious organizations and famous national figures was obtained; in addition, a "lay leaders" program recruited locally influential people. Over a four-year period more than 1,000 lay leaders participated in a weekend program of training leading to involvement in community and environmental changes for heart disease prevention. In addition, support from the family was enlisted to promote maintenance of smoking cessation and adherence to anti-hypertensive regimens.

Environmental change efforts included pressure on proprietors to promote and increase the availability of low-fat foods, to restrict smoking indoors, and to remove tobacco advertisements from the marketplace. Upon discovering that the majority of North Karelians would buy low-fat milk if it was available, the largest dairy in the county agreed to produce it. National legislation, in 1977 and 1978, which was stimulated by the North Karelia Project ensured the availability of a special soft butter to all Finns and prohibited the promotion of tobacco products.

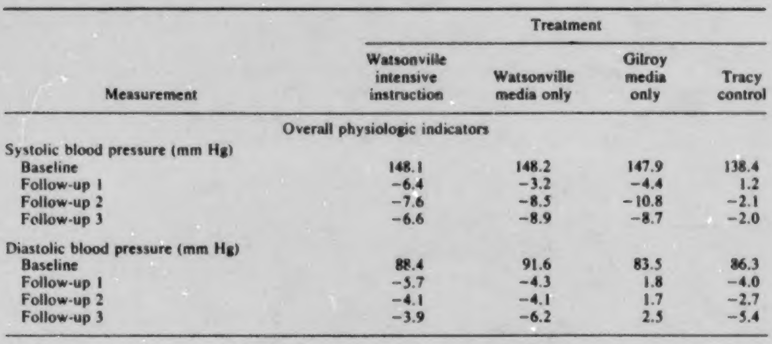
After completion of the original five-year community-based intervention program, in 1978, program activities were extended to North Karelian youth (Puska et al. 1981d). The two-year program focused on the seventh grade populations (13-year-olds) of three matched pairs of schools. About one-third of the 1000 subjects in the sample received intensive direct interventions to reduce coronary heart disease risk factors. The intervention program consisted of student, teacher, and parent education regarding coronary heart disease risk factors, including an anti-smoking program using peer leaders in the schools, changes in school nutrition programs, a project magazine issued four to six times a year, and parent meetings regarding changes in the home diet to suit the child's needs. The intensive program is being compared to two schools implementing a general countywide intervention and two schools in the reference county.

Reports of program effects on specific risk factors and risk behaviors are spotty and incomplete. Table 4 presents to our knowledge the only published risk factor results to date. Significant reductions were found among North Karelian males between 1972 and 1977 in cigarettes smoked per day, serum cholesterol, systolic blood pressure, diastolic blood pressure, and total risk score. Risks tended to increase in the control county, but not significantly. Similar effects were found among women in North Karelia and the control county for systolic blood pressure, diastolic blood pressure and total risk score; but not for cigarettes per day, and serum cholesterol. It is not possible to compare smoking results directly with the Stanford, Oslo, or MRFIT studies since cessation rates are not reported. No direct data about changes in dietary practices have been published to date. It is plausible, but not demonstrated, that reductions in cholesterol levels among males and diastolic and systolic blood pressures among both sexes were facilitated by restrictions in animal fat and sodium intake.

Particularly important was the finding from a nationally televised anti-smoking campaign that 10,000 of 40,000 smokers who participated in the campaign were not smoking six months later. This 25% viewer cessation rate is similar to those reported elsewhere for televised smoking cessation campaigns (McAlister 1976; Farquhar et al. 1977; Dubren 1977; Best 1978; Flay et al. 1983). Almost twice as many smokers viewed the nationwide broadcast in North Karelia as in the control commmunity (9.0% vs 4.8%), and roughly the same ratio were not smoking at one-month (3.9% and 2.0%) and six-month (2.3% and 1.3%) followups. However, the sample size was insufficient to detect significant differences in cessation rates between the "organized" and the "unorganized" communities.

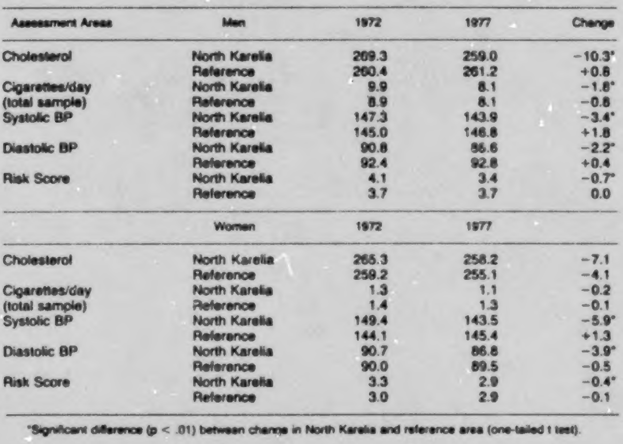
The finding of a higher total cessation rate in the organized community (North Karelia) when compared to the unorganized community and a national sample (1.1%) suggests that the effects of community interventions may be synergistic.

Results of the North Karelia Project between 1972 and 1977 are promising if somewhat ambiguous for morbidity



Measurement	Watsonville intensive instruction	Watsonville media only	Gilroy media only	Tracy control
	Treatment			
Overall physiologic indicators				
Systolic blood pressure (mm Hg)				
Baseline	148.1	148.2	147.9	138.4
Follow-up 1	−6.4	−3.2	−4.4	1.2
Follow-up 2	−7.6	−8.5	−10.8	−2.1
Follow-up 3	−6.6	−8.9	−8.7	−2.0
Diastolic blood pressure (mm Hg)				
Baseline	88.4	91.6	83.5	86.3
Follow-up 1	−5.7	−4.3	1.8	−4.0
Follow-up 2	−4.1	−4.1	1.7	−2.7
Follow-up 3	−3.9	−6.2	2.5	−5.4

Table 3. - Mean Values at Baseline and Percentage of Change from Baseline at Three Follow-Up Surveys for Systolic and Diastolic Blood Pressure: Stanford Three Community Study. Anthony J. Meyer, Joyce D. Nash, Alfred L. McAlister, Nathan Maccoby, and John W. Farquhar. Stanford Heart Disease Prevention Program, Stanford University school of Medicine. Skills Training in a Cardiovascular Health Education Campaign. Journal of Consulting and Clinical Psychology, 48(2):129-142, 1980. © 1980, The American Psychological Association, Inc. Reprinted by permission.



Assessment Areas	Men	1972	1977	Change
Cholesterol	North Karelia	269.3	259.0	−10.3*
	Reference	260.4	261.2	+0.8
Cigarettes/day	North Karelia	9.9	8.1	−1.8*
(total sample)	Reference	8.9	8.1	−0.8
Systolic BP	North Karelia	147.3	143.9	−3.4*
	Reference	145.0	146.8	+1.8
Diastolic BP	North Karelia	90.8	86.6	−2.2*
	Reference	92.4	92.8	+0.4
Risk Score	North Karelia	4.1	3.4	−0.7*
	Reference	3.7	3.7	0.0
	Women	**1972**	**1977**	
Cholesterol	North Karelia	265.3	258.2	−7.1
	Reference	259.2	255.1	−4.1
Cigarettes/day	North Karelia	1.3	1.1	−0.2
(total sample)	Reference	1.4	1.3	−0.1
Systolic BP	North Karelia	149.4	143.5	−5.9*
	Reference	144.1	145.4	+1.3
Diastolic BP	North Karelia	90.7	86.8	−3.9*
	Reference	90.0	89.5	−0.5
Risk Score	North Karelia	3.3	2.9	−0.4*
	Reference	3.0	2.9	−0.1

*Significant difference ($p < .01$) between change in North Karelia and reference area (one-tailed t test).

Table 4. - Mean Risk Factor Levels for Men and Women in North Karelia and Reference Area in 1972 and 1977. Alfred McAlister, Pekka Puska, Jukka T. Salonen, Jackko Tuomilehto, Kaj Koskela. Theory and action for Health Promotion: Illustrations from the North Karelia Project. American Journal of Public Health, 72:43-50, 1982. © 1982, The American Public Health Association. Reprinted by permission.

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and mortality outcomes. The strongest findings were among the younger aged persons (30-54 years) of both sexes (a finding that may have relevance for MRFIT). The incidence of acute myocardial infarctions (AMI) fell 24% in men and 36% in women from 1972 to 1977. In the same age group there was a reduction of 52% in men in the incidence of cerebral stroke, and 68% in women. The effects for older persons were in the same direction, but weaker. During 1977 the incidence of AMIs for both men and women of all ages in the study (30-64) was significantly different in North Karelia (11.1/1000 for males and 2.8 for females) and the control community (12.8/1000 for males and 3.8 for females). Changes in rates from baseline were not different, however. Although this may be due to the availability of poorer quality data early in the study, this non-significant finding raises some ambiguity about the effects of the community program on cardiovascular morbidity in the 30 and older population.

Summary of the Heart Disease Prevention Trials

Examination of Table 5 allows a quick comparison of major features of the target audience, program content, campaign objectives, and important outcomes of each of the major heart disease prevention programs. Target audience characteristics may be summarized as follows. Two of the programs (MRFIT and Oslo) targeted for intervention only the minority of persons who were found to be at high risk to coronary heart disease (middle-aged or older males with two or more established risk factors present). The other two programs directed interventions to the entire population, although the Stanford program also developed special interventions for a sample of high-risk persons in one community. It should be noted that, whatever the target audience for the campaign, all programs restricted major surveys to mature adults (30+).

Two of the programs (those directed exclusively at high-risk males) relied entirely on medical or allied medical personnel working largely out of medical clinics. The Stanford program operated completely independently of medical facilities. The North Karelia program included, among other components, the reorganization of certain health care services. The two campaigns directed at the general public included broadcast television and other media. The Stanford program was predominantly media based. Only North Karelia formally involved school interventions, and North Karelia was the only program to attempt community organization for heart disease prevention. All programs included a family-involvement component, and all provided individual as well as group instruction.

Table 5 - Comparison of the Community Heart Disease Prevention Programs

	TARGET AUDIENCE						PROGRAM								DESIGN FEATURES			PROGRAM EFFECTS					
	Risk		Age		Sex																		
	hi risk	gen pop	30+	11	Male	All	Med Clinic	TV	other media	school	Com Org.	Family Involvement	Ind Instr	Intensity of the campaign high	Component Test	Measure Youth	True exp'l comparisons	Smoking Cessation	Dietary Changes	Ser.Chol.Change	B.P.Changes	Total Risk Factor Changes	Mortality/ Morbidity
MRFIT	X		X		X		X					X	X	X			X	+	+	+	+	+	-
OSLO Heart Study	X		X		X		X					X	X				X	+	+	+	+	+	+
STANFORD Three Community Study	X	X	X	X		X		X	X			X	X	X	X			$+^{T}$	+	+	+	+	*
North Karelia Project		X	X	X		X	X	X	X	X	X	X	X	X				$+^{T}$	*	+	+	+	?

X	Present or observed
+	Variable measured, positive effect found
-	Variable measured, but no effect found
*	Not reported
?	Equivocal
T	Independent effect found for televised smoking cessation interventions

Although it is not apparent in Table 5, all programs attempted to teach skills in effective strategies for heart disease prevention. The intensity of each campaign, except the one in Oslo, was at least moderately high, and the intensity of the North Karelia Project was very high.

Only the two programs directed exclusively at high risk persons had truly randomized designs. The two involving whole-population interventions had single communities assigned (not altogether randomly) to the experimental and control conditions. Hence, MRFIT and the Oslo study provide important conceptual replications with randomized experimental designs, of the quasi-experimental community programs at Stanford and North Karelia. Only the Stanford program did anything in the way of testing the effectiveness of individual program components (mass media for the whole community and individualized instruction for persons at high risk). Although both Stanford and North Karelia developed their interventions to reach very young people as well as adults, they collected outcome measures only from mature adults (30 years or older). This seriously limits one's ability to draw direct conclusions about the potential of these approaches for drug abuse prevention. Another limiting factor was the emphasis placed in the campaigns and measures on smoking *cessation* and dietary *changes*, to the exclusion of *preventing onset of smoking and unhealthy dietary practices*. These latter objectives are most relevant to drug abuse prevention.

Effects of programs on targeted behaviors were uniformly positive. Most encouraging were the consistent positive effects on smoking cessation and cessation maintenance. Also important was the finding in the three studies where it was reported, that lasting dietary changes were achieved. Positive changes in blood lipids and blood pressure, which occurred in all the studies, are consistent with positive behavioral changes, as is the consistent effect of interventions on total risk score. Findings regarding program impact on mortality and morbidity rates are mixed, but since they are at least two steps removed from the objective of producing lasting behavior changes, they are of little consequence for drug abuse prevention.

One advantage of comprehensive community prevention programs that is clearly demonstrated by the heart studies is that they provide continuity in a way that any single-component progam introduced into the community by a peripheral organization, such as the university, cannot. Continuity is important. All of the experimental community heart disease prevention campaigns reviewed above lasted for at least three years, and at least one lasted as long as seven years. The positive findings for the three-year Stanford media campaign stand in sharp contrast to findings from the usual single-shot television campaigns (Flay and Sobel, this volume).

The heart trials also provide evidence that multi-component programs are more effective than single-component programs. In the Stanford Three Community Study, smoking cessation rates were higher and better maintained in the community where some of the high-risk persons received individual instruction as well as the mass media presentations available to everybody. Similarly, in a study reported by Flay et al. (1983) an integrated school-television program was much more effective in reaching smoking parents than a television program alone, and resulted in a far greater rate of smoking cessation at one year followup. Viewership of a nationally televised smoking cessation series was higher in the North Karelia Project where community organization for heart disease prevention had occurred, than in the rest of Finland where it had not. One-month and six-month cessation rates appear to have been higher where community organization occurred as well. In summary, television programs for smoking cessation appear more effective when supported by other activities to promote cessation-relevant interaction within the family or community.

DESIGN CONSIDERATIONS FOR COMMUNITY DRUG ABUSE PREVENTION RESEARCH

The new generation of community heart disease prevention programs. Four recently developed community research and demonstration programs in heart disease prevention have greatly improved upon the program and design limitations of previous studies. These limitations have been reviewed elsewhere by Farquhar (1978), Leventhal et al. (1980), and Kasl (1980). The second generation of community heart disease prevention programs will be reviewed briefly here for their several contributions. They include: The Stanford Five Cities Study, begun in 1978 (Farquhar 1978; Farquhar et al. 1981; Maccoby and Solomon 1981; Maccoby 1983, in press); the Minnesota Heart Health Program, begun in 1980 (Luepker et al. 1982; Luepker 1983, in press); the Pawtucket (Rhode Island) Heart Health Program, begun in 1982 (Elder et al. 1982; Abrams et al. 1982; Abrams and Elder 1983, in press); and the Community Health Improvement Program of Lycoming County, Pennsylvania, begun in 1980 (Felix 1983).

The major features of these programs are: mass media campaigns, community-based organization, adult education, youth education, health professional education, and mass screening or health medical services. The following discussion will examine the differences in program focus for each study.

The Stanford and Minnesota Programs have been designed to institutionalize the community's role in prevention, in a manner resembling the mobilization effort in North Karelia. The eight-year-long Stanford Five City Project will provide the necessary "software" and training to community leaders who will then facilitate the provision of the program by existing local groups now and beyond the study. Similarly, the nine-year Minnesota program will incorporate the involvement of opinion leaders and other key leadership throughout the project term to establish community staffing and support in the long run. Minnesota staff members are consistently more involved in day-to-day implementation in participating communities than is the Stanford group. The development of cost effective prevention models which can be replicated in other communities is one vital community organization function which is the focus of these programs (Farquhar 1978; Farquhar et al. 1981; Maccoby and Solomon 1981; Luepker et al. 1982).

In contrast, the Rhode Island and Pennsylvania programs have to date focused on an "organizational approach" to community prevention programs. In the six-year-long Pawtucket program, gaining support from organizational gatekeepers provides the basis for the development of risk factor reduction programs which are coordinated by task forces of organizational members where feasible (Elder et al. 1982). Compared to the Minnesota program, there is much less involvement of doctoral level researchers in organizational efforts, and greater reliance on subprofessional personnel recruited from the community to carrry out program implementation. The five - year - long Pennsylvania Program has been highly successful in developing an extensive worksite program in private industry (Felix 1983). Researchers in both the Pawtucket and Lycoming County programs have field-tested their worksite, behavioral, weight reduction programs with very promising results (Stunkard and Brownell 1980; Abrams and Follick 1983; Brownell et al. in press). This form of community organization focuses more on "proximal" approaches to behavior change - both at the individual and small group levels - than on more "distal" community-wide interventions such as media campaigns and medical professional interventions.

The new generation of community heart disease prevention programs provides an excellent opportunity for gaining insight into youth-oriented approaches to prevention. The Minnesota and Rhode Island Programs target youth between the ages of six and eighteen, and the Stanford

Program focuses on youth from twelve to eighteen years of age. The Pennsylvania program has developed a Peer Helpers component which trains youth to discourage smoking by their parents. These programs have taken the view that youth involvement is an important component of a total prevention program.

Several design improvements have been built into these studies. In each case, there are at least two intervention communities and paired control communities. The Minnesota design provides multiple replications in three pairs of towns that differ in size, urban characteristics, and media patterns. All appear to be interested in collecting quality data on behavioral as well as biological endpoints, and behavioral data are collected from young people (as young as age six at Minnesota and 12 at Stanford) as well as adults. In these projects, considerable attention is given to preventing and measuring the onset of cigarette smoking, unhealthy dietary practices, and sedentary lifestyles in youth.

This second generation of heart disease prevention research is still limited in one important way. None has planned a rigorous test of the relative effectiveness of different program components. In fairness, it should be pointed out that this limitation was imposed by the primary objective of increasing overall power to detect effects on mortality/morbidity. In community drug abuse prevention research, this restriction does not hold. Drug abuse prevention researchers should be encouraged to explore, within limits of power and characteristics of communities for assignment, the relative efficacy for drug abuse prevention of various community components and intervention strategies.

CONCLUSIONS

There is reason to be optimistic about the potential of comprehensive community programs for drug abuse prevention. The potential for productive research in community prevention is great. Behavioral technologies for prevention, strategies for community organization, and methodologies for community research design and assessment are now sufficiently well developed for productive research in community drug abuse prevention to take form.

Several promising community-based programs for drug abuse prevention are underway, including those in San Francisco (Wallack and Barrows 1981); Charlotte, N.C. (Kim 1981a, b and 1982; Ventura, California (National Institute on Drug Abuse, 1982a, b; Skager, no date); and

Seattle, Washington (Resnik 1982; NIDA 1982c). Unfortunately, except for the programs in San Francisco and Charlotte, it is not clear that any meaningful evaluation of any of these projects will be forthcoming. Project SMART at USC is an experimental drug abuse prevention program that is being rigorously evaluated (Johnson and Graham 1983; Graham et al. 1983). It compares alternative approaches to prevention derived from successful smoking prevention strategies and relevant social psychological and behavioral theory and findings. Although this program has community research implications (it involves diffusion throughout the second largest school system in the country, and takes preliminary steps towards mobilizing and assessing the effects of family involvement), it is nothing like a comprehensive community prevention research program. We view comprehensive community research as the next logical step in the development of drug abuse prevention research.

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Prevention of Adolescent Substance Abuse Through the Development of Personal and Social Competence

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INTRODUCTION

Experimentation with a wide variety of substances for many adolescents appears to have become an integral part of the coming of age in America. Unfortunately, early experimentation often leads to regular use and, for all too many individuals, this may result in compulsive patterns of use characterized in many cases by both psychological and physiological dependence. Treatment programs designed to either help individuals achieve total abstinence, or modify their pattern of use, appear to be only moderately effective, with virtually all programs being plagued by high rates of recidivism. As a consequence, the prospect of developing effective substance abuse prevention strategies holds a great deal of appeal. However, until recently the development of effective substance abuse prevention programs has remained only an illusive goal.

In this chapter an argument is made for a more comprehensive approach to substance abuse prevention than has been utilized previously. The type of approach being suggested focuses on both the enhancement of personal competence through the development of basic "life skills" and the acquisition of problem-specific skills and knowledge designed to increase adolescents' ability to resist the various forms of social pressure to smoke, drink, or use drugs.

The first three sections of this chapter deal with issues concerning the etiology of adolescent substance use. The next three sections briefly summarize traditional educational approaches to substance abuse prevention and the more recent psychosocial approaches which have been tested primarily on cigarette smoking, and a re-examination of some of the underlying assumptions of these approaches. Two sections are devoted to conceptual issues which can help provide a framework for preventive interventions along with specific implications for developing effective prevention strategies. The next three sections summarize general strategies for enhancing personal competence as well as highlighting the kind of problem-specific skills and knowledge that are likely to facilitate substance abuse prevention. This material is followed by a section which describes a prevention program called Life Skills Training. This program incorporates the kind of generic life skills and problem-specific skills suggested by the preceding sections of this chapter. The chapter ends with a section which provides summary and conclusions and a final section which outlines some recommendations for future research.

INITIATION AND EARLY STAGES OF USE

The initiation and early stages of tobacco, alcohol, and drug use typically occur during adolescence (Botvin and McAlister 1981). The initial use of most substances tends to be confined to social situations, with solitary use being relatively uncommon. Indeed, it has been suggested that the use of tobacco, alcohol, or drugs may provide a major focus for group interaction and identity (Becker 1967; Jessor 1975). While psychosocial factors appear to be primarily responsible for the initiation of substance use, as use becomes more regular, psychopharmacological factors become increasingly important in reinforcing and maintaining regular patterns of use (Meyer and Miran 1979; Oakley 1972). Despite warnings from parents, teachers, and the media, most adolescent substance users (particularly during the early stages of use) exhibit a remarkable absence of concern about the dependency that may result from the frequent use of tobacco, alcohol, and certain drugs, and they tend to overestimate their ability to avoid personally destructive patterns of use. Adolescent cigarette smokers, for example, typically believe that they can quit smoking any time they want (Botvin 1978). It is not until they have actually made a serious effort to quit smoking that they may gain a real appreciation of the extent to which they are both psychologically and physiologically dependent on tobacco.

The sequence of experimentation and regular use of psychoactive substances observed in most individuals suggests what has been referred to as a substance use hierarchy (Hamburg et al. 1975; Kandel et al. 1978). Individuals typically begin with the use of tobacco and alcohol, followed later by the use of marijuana. Some individuals may eventually progress to the use of depressants, stimulants, and psychedelics. Generally, the use of opiates and cocaine appears towards the end of this progression, although for some sociocultural groups experimentation with opiates may occur just after the initial use of alcohol.

Given the fact that most adolescents stop at particular points in this sequence, controversy exists concerning the extent to which "soft" substances (e.g., tobaco, alcohol, and marijuana) lead to the use of other more dangerous "hard" substances (Goode 1974). Although many individuals do not go on to use "hard" drugs, it has been pointed out that without the prior use of tobacco, alcohol, and even coffee, there would be no progression (Blum and

Richards 1979; Hamburg 1975). Furthermore, the experience of altering or controlling consciousness or mood with a psychoactive substance, if perceived as positive, may provide the impetus for experimentation with stronger substances.

DETERMINANTS OF SUBSTANCE USE

The available evidence suggests that a number of factors may promote and/or facilitate the initiation of substance use (Blum and Richards 1979; Braucht et al. 1977; Jessor 1975; Wechsler 1976). Among these are pro-substance-use social influences coming from the family, the peer group, and the media; psychological factors such as an external locus of control, low self-esteem, low self-satisfaction, a greater need for social approval, low social confidence, high anxiety, low assertiveness, impulsivity, rebelliousness, and an impatience to assume adult roles; and developmental factors, particularly those related to cognitive and social development, which may tend to increase adolescents' susceptibility to pro-use social pressures. Moreover, knowledge about the health, social, and legal consequences of use along with negative attitudes toward substance use might logically be expected to deter use. However, while there may be a relationship between knowledge, attitudes, and use, this relationship is complex and poorly understood.

Finally, substance users and nonusers have been found to differ along several behavioral dimensions, suggesting a difference with respect to orientation, values, and aspirations. In general, individuals who smoke, drink, or use drugs tend to get lower grades in school, do not participate in organized extra-curricular activities such as sports or clubs, and are more likely than nonusers to engage in antisocial behavior such as lying, stealing, and cheating (Demone 1973; Jessor et al. 1972; Wechsler and Thurn 1973). Furthermore, high intercorrelations exist between a variety of substances so that, for example, adolescents who smoke cigarettes are also likely to drink or smoke marijuana.

Interestingly, the use of tobacco, alcohol, and drugs has also been found to be associated with other health-related behaviors such as premature sexual activity and delinquency. According to Jessor, "one of the clearest facts to have emerged from the past decade of research is that there is substantial covariation among many of these health-related behaviors, that is they tend to occur together within the same adolescent." The correlations between these behaviors may be quite substantial and are evident for both males and females. Furthermore, in addition to highly significant intercorrelations among various health-compromising behaviors, they "correlate in a similar way with a large number of personality and environmental measures of psychosocial risk" (Jessor 1982, p.453). In other words, a number of problem behaviors appear to be caused by the same underlying factors. As a consequence, related health-compromising behaviors may most usefully be viewed as a syndrome rather than as separate or idiosyncratic behaviors.

SUBSTANCE USE AND ADOLESCENT DEVELOPMENT

Adolescence is a period of great physical and psychological change. During adolescence, individuals experiment with a variety of behaviors and lifestyle patterns as part of the natural process of separating from parents, developing a sense of autonomy and independence, establishing an identity, and acquiring the skills needed to function effectively in an increasingly adult world.

Profound cognitive-developmental changes occur during the beginning of adolescence which significantly affect adolescents' views of the world, and the manner in which they think. In contrast to the pre-adolescent's concrete operational mode of thinking which is rigid, literal, and grounded in the "here and now," adolescent thought is more relative, abstract, and hypothetical (Piaget 1932). This enables adolescents to conceive of a wide range of possibilities and logical alternatives, to accept deviations from established rules, and to recognize the frequently irrational and inconsistent nature of adult behavior.

Changes also occur with respect to the relative influence of peers and parents. As individuals approach adolescence, there is a progressive decline in parental influence and a corresponding increase in the influence of peers and other socializing agents (Utech and Hoving 1969). Furthermore, adolescents tend to have a heightened sense of self-consciousness--referred to as "adolescent egocentrism"--about their appearance, personal qualities, and abilities (Elkind 1978).

These and other developmental factors increase adolescents' risk of yielding to the various direct and indirect pressures to smoke, drink, or use drugs. The use of some substances (e.g., cigarettes and alcohol) is age-graded and, therefore, is proscribed for children and adolescents while viewed as acceptable for adults. Thus, engaging in these behaviors may be an attempt to lay claim to adult status. Similarly, since the use of illicit substances is legally proscribed for both adolescents and adults, their use may serve as a means of establishing solidarity with a particular reference group, rebelling against parental authority, establishing a sense of identity, and so forth.

Moreover, while the combination of adolescent egocentrism and increased reliance on the peer group may tend to promote substance use in some individuals, the cognitive developments occurring prior to and during this period may also serve to undermine previously acquired knowledge relating to the potential risks of using these substances. For example, the adolescent's new cognitive orientation may enable him to discover inconsistencies or logical flaws in arguments being advanced by adults concerning the risks of substance use or to formulate counter-arguments permitting rationalizations for ignoring these risks--particularly if substance use is perceived to have social or personal benefits. Thus, a recognition of the developmental tasks, issues, changes, and pressures motivating adolescent behavior is necessary to fully understand the etiology of substance use/abuse.

EDUCATIONAL APPROACHES TO SUBSTANCE ABUSE PREVENTION

For the most part, substance abuse prevention programs have been almost completely informational. Tobacco, alcohol, and drug prevention programs have been largely based on the assumption that increased knowledge about these substances and the consequences of their use would be an effective deterrent (Goodstadt 1978). Smoking education programs typically provide students with factual information about the long-term health consequences of smoking (Thompson 1978). Similarly, alcohol and drug education programs have primarily attempted to increase students' knowledge about the legal, pharmacological, and medical aspects of using these substances (Goodstadt 1978). More recently, a variety of other types of prevention strategies have been implemented. These programs have attempted to enrich the personal and social development of students by developing programs designed to increase self-esteem and interpersonal skills, and foster participation in alternative activities.

A number of reviews have been published concerning the effectiveness of substance abuse prevention programs (Berberian et al. 1976; Braucht et al. 1973; Dorn and Thompson 1976; Goodstadt 1974; Pyramid 1976; Richards 1969; Schaps et al. 1981; Swisher and Hoffman 1975). The general consensus of these reviews is that most substance abuse prevention programs do not contain adequate evaluation components. Some programs reviewed which had sound evaluation designs did not contain any measures of drug use behavior. For example, Schaps et al. (1981) found only four relatively well-designed studies out of the 127 program evaluations they reviewed which utilized substance use measures. Of these, only two showed a positive impact on behavior.

Evaluations of programs which focused on providing factual information as their main strategy clearly indicate that increased knowledge has virtually no impact on drug use or on intentions to use drugs. On the other hand, although some studies which contained cognitive and affective components have produced at least some positive results (e.g., Carney 1972; Swisher et al. 1973), in general affective education approaches appear to have placed too little emphasis on the acquisition of the kind of skills that are likely to increase general personal competence and enable students to cope with the various interpersonal and intrapersonal pressures to begin using tobacco, alcohol, or drugs. Unfortunately, the inescapable conclusion to be drawn from the existing substance abuse prevention literature is that few studies have demonstrated any degree of success in terms of actual substance abuse prevention.

PSYCHOSOCIAL PREVENTION STRATEGIES

Potentially effective approaches to substance abuse prevention are suggested by recent research in the area of smoking prevention. Several research groups around the country have demonstrated the efficacy of prevention stragegies focusing on the psychosocial factors believed to be involved in the initiation of cigarette smoking (Botvin et al. 1980; Evans et al. 1978; Hurd et al. 1980; McAlister et al. 1979). All these approaches are similar in that they have their roots in social learning theory (Bandura 1977) and problem behavior theory (Jessor and Jessor 1977), although differences exist with respect to both their emphasis and modes of implementation. For example, some approaches place primary emphasis on increasing students' awareness of pro-smoking pressures, teaching specific techniques for resisting such pressures; while others emphasize the development of more general coping skills and take a broad spectrum approach by attempting to target several of the most significant underlying determinants of cigarette smoking. These two types of prevention program have produced reductions in new smoking by approximately 50%.

THE ASSUMPTIONS OF EDUCATION/PREVENTION STRATEGIES

A closer look at some of the basic assumptions of traditional substance abuse education programs as well as the more recent psychosocial prevention strategies, in light of what is known about the cognitive, attitudinal, social, personality, and developmental factors which appear to play important roles in the initiation and early stages of substance use/abuse, suggests the need for a broader approach to substance abuse prevention. First, most traditional educational approaches are based on the assumption that individuals begin to smoke, drink, or use drugs because they are unaware of the potential risks. However, given the diversity of variables associated with substance use, it seems evident that substance use/abuse is not simply a problem rooted in an absence of knowledge about the health, social, and legal risks--although this certainly may be a contributing factor for some individuals.

Second, some of the more recently developed psychosocial prevention strategies (e.g., Evans et al. 1978; Evans et al. 1981) are based on the assumption that the principal reason adolescents begin to smoke, drink, or use drugs is "peer pressure." As a consequence, this type of prevention strategy has focused almost exclusively on providing students with tactics for resisting peer pressure. While high correlations have been found consistently between individuals' substance use and that of their friends, it is unclear to what extent these associations are the result of peer pressure rather than a process of mutual self-selection. Another point which is frequently overlooked is that since most adolescents do not smoke or use drugs, the peer pressure experienced by most individuals would be in a direction consistent with non-use rather than use. Finally, reliance on strategies which focus exclusively on teaching adolescents pressure resistance tactics may be inadequate since they implicitly assume that all individuals who begin using drugs do so because they lack the necessary skills to resist pro-substance-use pressures. However, individuals who perceive substance use as desirable for whatever reason will not be prevented from substance use by merely teaching them pressure resistance skills, since some individuals may actually want to engage in these behaviors.

A CONCEPTUAL FRAMEWORK FOR PREVENTIVE INTERVENTIONS

In view of the number of factors which have been associated with substance use among adolescents, it seems clear that no one factor is both necessary and sufficient to cause these behaviors. Rather, it appears that adolescent substance use/abuse is the result of the complex interplay of a diversity of factors. Indeed, a number of multivariate models have been posited to explain how the various social, personality, cognitive, attitudinal, and behavioral factors interact to produce use and/or abuse (e.g., Flay et al. 1981; Jessor and Jessor 1977).

Although theories concerning the etiology of substance abuse are plentiful (Lettieri et al. 1980), few of these appear to have any direct relevance to the development of effective prevention strategies. However, despite the vast array of substance abuse theories and the lack of a single unified theory concerning the initiation of substance use and abuse, both social learning theory (Bandura 1977) and problem behavior theory (Jessor and Jessor 1977) provide a useful conceptual framework for understanding the etiology of substance use. From this perspective, substance use is conceptualized as a socially learned, purposive, and functional behavior which is the result of the interplay of a diversity of social (environmental) and personal factors.

Some individuals may seek out other individuals who smoke, drink, or use drugs or may be motivated to engage in those behaviors themselves as a way of coping with expected failure, or as an alternative way of achieving some specific goal (e.g., some adolescents may begin to smoke, drink, or use drugs in response to the fact that they are not doing well academically and as an alternative means of achieving popularity, social status, or self-esteem). The use of tobacco, alcohol, and certain other drugs may also be used to cope with anxiety, particularly that induced by social situations. Other individuals may begin smoking, drinking, or using drugs as a result of the social influence process. That is to say, they may be influenced to begin using one or more substances after repeated exposure to high status models engaging in these behaviors, or as the result of persuasive appeals made by advertisers or peers. Differential susceptibility to social influence appears to be mediated by personality, with individuals who have low self-esteem, low autonomy, low self-confidence, and an external locus of control being more likely to succumb to these influences (Bandura 1969; Rotter 1972). Thus, adolescents may begin smoking, drinking, or using marijuana for a variety of different reasons, suggesting not one but several different pathways to substance use.

IMPLICATIONS FOR PREVENTION

One obvious implication from this type of conceptual model is that substance use/abuse might be prevented by intervening on the environmental level, i.e., eliminating the social influences to become a smoker, drinker, or drug user. This might be accomplished in the case of cigarette smoking, for example, by eliminating cigarette advertising and smoking role models, by increasing the visibility of attractive high status nonsmoking role models, and by decreasing the social acceptability of smoking. However, such changes are difficult and may take years to achieve.

Alternatively, substance use and abuse might be prevented by intervening on the personal level. This might be accomplished by (a) increasing students' ability to deal with direct interpersonal pressure to smoke, drink, or use drugs, and (b) reducing intrapersonal pressures to use these substances. The students' ability to deal with interpersonal pressures to become users may be increased by making them aware of the various social pressures to use these substances and by teaching them specific skills to counter these pressures (e.g., interpersonal skills to resist peer pressure).

Furthermore, students' susceptibility to intrapersonal influences might be reduced by increasing their self-esteem, sense of personal control, self-confidence, self-satisfaction, and ability to cope with anxiety. While this may not appear to be an easy task, there is evidence to suggest that this might be accomplished by improving personal competence and increasing general adaptive behavior (Hjelle 1974; Marlatt et al. 1976; Parks et al. 1975; Percell et al. 1974). Thus, as an alternative (or in addition) to intervening upon the school or community environment, a logical approach to substance abuse prevention might involve both teaching students pressure resistance tactics to deal with explicit interpersonal pressure to use drugs, and fostering the improvement of general personal competence as a means of reducing intrapersonal pressures.

SOCIAL COMPETENCE AND SOCIAL SKILLS TRAINING

The acquisition of adequate social skills may well play an important role in psychological adjustment and psychosocial development. Basic interpersonal skills are necessary for confident, responsive, and mutually beneficial relationships and are perhaps among the most important skills that an individual must learn. Inadequate social skills may cause problems in interpersonal relationships or may interfere with optimal functioning in school, work, or recreational situations (Coombs and Slaby 1977). More importantly, a lack of social competence may lead to rejection and social isolation which may result in poor psychological adjustment.

The acquisition of social skills begins during childhood, and as individuals mature, they generally become more socially adroit. By the time individuals become adolescents they are expected to have acquired a repertoire of social skills such as those involved in communicating effectively, initiating and maintaining conversations, giving and receiving compliments, asking someone out for a date, denying unreasonable requests, expressing feelings, etc. For the most part, social skills are learned through a combination of imitation and reinforcement. However, the development of these skills is dependent upon having the opportunity to observe and practice them.

For a variety of reasons, many individuals do not sufficiently master these skills. Over roughly the last decade there has been considerable interest on the part of researchers and clinicians concerning the development of effective strategies for helping people improve their social competence. Numerous studies have been reported involving attempts to teach a variety of social skills to adult psychiatric patients, college students, adolescents, and children. Social skills training has been applied to a number of different areas involving interpersonal interaction. For example, social skills training has been used to decrease anxiety and enhance social skills involved in dating (Curran 1976; Curran and Gilbert 1975), to improve the interpersonal behavior of adolescent offenders (Thelan et al. 1976), to teach conversational skills to pre-delinquent girls (Minkin et al. 1976) and socially isolated children (Whitehill 1978), and to teach problem-solving and communication skills to parents and adolescents (Robin et al. 1977).

However, by far the most common application of social skills training involves teaching people to be more assertive, that is, to express their feelings, needs, preferences, or opinions directly and honestly. Although assertive difficulties were initially viewed from the perspective of social anxiety, more recently they have been viewed as behavioral deficits independent of the attendant anxiety (Hersen et al. 1973; McFall and Twentyman 1973).

Assertiveness training focuses on both verbal and nonverbal (paralinguistic) assertive behaviors. Verbal assertive skills involve learning what to say (no-statements, requests, refusals), whereas nonverbal assertive skills include eye contact, loudness of voice, facial expressions, distance, and body expression. Assertive skills are typically taught using a combination of instruction, modeling, feedback, social reinforcement, and behavior rehearsal.

A number of studies have tested the effectiveness of social skills training for increasing assertiveness. Studies using individual subjects (Eisler et al. 1974; Hersen et al. 1975) and control group designs (Goldsmith and McFall 1975) have demonstrated the effectiveness of assertive training for improving both the behavior and subjective feelings of comfort in social situations of psychiatric patients. Although the results of these studies generally only provide evidence of short-term effectiveness, some studies have found these results to be relatively stable (Hersen et al. 1975).

Studies conducted with college students have also demonstrated the effectiveness of social skills training procedures for increasing assertive behaviors (McFall and Twentyman 1973; McFall and Marston 1970; McFall and Lillesand 1971; Wolfe and Fodor 1977). Not only do these studies demonstrate the short-term effectiveness of social skills training, but they have shown that significant improvement may be achieved with very brief treatment (McFall and Twentyman 1973; Schinke et al. 1979), and even without practice (McFall and Lillesand 1971). While practice has generally been found to maximize the effects of social skills training, the practice does not necessarily have to be overt. For example, Kazdin (1974) found that even covert practice could facilitate the learning of these skills.

Assertive behaviors have also been taught to children. Bower et al. (1976) taught passive fourth grade girls to be more assertive using a combination of instruction, modeling, discussion, feedback, and practice. The results were judged to generalize to real-life situations as was evidenced by an increase in the use of assertive tactics in the classroom. Bornstein et al. (1977) trained unassertive children using instruction, behavior rehearsal, modeling, and feedback. The results indicated large increases over baseline levels for both trained and untrained role-play scenes, and these levels were maintained at two- and four-week follow-ups.

Several excellent reviews of adolescent social skills training have been published (e.g., Gilchrist 1981; Goldstein et al. 1979; Pentz and Tolan 1983; Rotheram and Armstrong 1980; Schinke 1981). Although much of the early social skills training research which has been conducted focuses on the remediation of existing deficits, more recently there has been a shift toward the use of social skills training with normal adolescent populations as a means of enhancing personal competence. In a review of 117 adolescent social skills training studies, Pentz and Tolan (1983) found that while most of the studies they reviewed were of the deficit remediation type, there was a general emphasis on the development of positive social skills such as prosocial behavior, assertiveness, and initiating conversations. Perhaps most importantly, over 93% of the studies they reviewed reported total effectiveness with better results being associated with training conducted in school or community settings among normal adolescent populations. Finally, as Pentz noted in this volume, there is recent evidence to suggest that social skills training may have a positive impact on substance abuse prevention.

ANXIETY REDUCTION TECHNIQUES

Several different techniques have been used to help individuals cope with anxiety. These techniques fall into two categories: relaxation training and cognitive restructuring. The most widely used relaxation technique is called progressive deep muscle relaxation and was initially developed by Jacobsen (1938). This technique, as it is currently used, involves the systematic tensing and relaxing of specific muscle groups. The main objective of progressive relaxation is to make patients aware of the presence of even mild tension and to provide them with a means of eliminating it. This technique may be beneficial in two ways. First, it can be used to generally lower physiological arousal throughout the day. Second, it can be used to respond to specific environmental stressors.

The effectiveness of progressive relaxation for reducing physiological arousal has been documented by a number of researchers (Lehrer 1972; Matthews and Gelder 1969; Paul 1969). In one study (Israel and leiman 1977), live and taped progressive relaxation training was compared with self-relaxation using measures of physiological arousal (heart rate, respiration rate, and muscle tension) and subjective measures of tension. The relaxation training was conducted in three 30-minute sessions. The results showed significant in-treatment reduction of physiological arousal for all groups. Furthermore, all relaxation treatments led to significantly reduced levels of subjective tension; however, the live progressive relaxation training was more effective than either taped progressive relaxation or self-relaxation.

Borkovec and Sides (1979) recently reviewed 25 well-controlled studies of progressive relaxation to determine the extent to which progressive relaxation produced physiological changes and under what conditions. Examination of these studies indicated that there is little uniformity in the teaching of progressive relaxation. Some training procedures involved many sessions, others involved very brief training (one or two sessions); some used a pre-recorded tape, others used live procedures that could be paced to individual subjects. Borkovec and Sides concluded that although some studies using a brief or taped training procedure produced significant relaxation effects when used with a normal population, multi-session subject-controlled (live) procedures are generally more effective, particularly when used with clinical populations.

Indeed, many studies have demonstrated the ability of relaxation training to decrease anxiety both during treatment and beyond the treatment session (Lazarus 1958; Weil and Goldfried 1973). Analysis of posttreatment questionnaires in several well-controlled outcome studies indicated that the people who benefited from the treatment reported that they used relaxation as an *active coping skill* (Bootzin and Kazdin 1972; Sherman 1972). In addition, Sherman (1972) found that subjects desensitized to fear of water were able to utilize their newly acquired ability to relax to cope with other situations creating anxiety such as taking tests and public speaking.

Goldfried (1971) suggested that systematic desensitization indirectly teaches individuals how to use relaxation to cope with anxiety and modified the traditional desensitization procedure so that emphasis was placed on teaching relaxation as an active coping skill. The effectiveness of self-control relaxation was tested on 27 college students who had difficulty with speech anxiety (Goldfried and Trier 1974). Subjects were trained via standard relaxation training and self-control relaxation. In the latter, the relaxation technique was presented as an active coping skill which could be used to alleviate tension in a variety of situations causing anxiety, including public speaking. Moreover, the subjects were encouraged to apply their relaxation skills to real-life situations inducing anxiety. The treatment consisted of five weekly one-hour live sessions and an additional two sessions per week using a tape. The results demonstrated the effectiveness of the self-control relaxation procedure for reducing speech anxiety as well as other types of anxiety not focused on during training. In addition, the students in the self-control group expressed greater satisfaction with the procedure than those who saw it as a passive procedure. In a separate study (Chang-Liang and Denny 1976), self-control relaxation was also found to be an effective treatment for test anxiety. The evidence, therefore, indicates that presenting relaxation as an active coping skill can increase its effectiveness above that of the traditional approach.

Anxiety reduction strategies that are even more cognitive than those described above involve what has been referred to as *cognitive restructuring*. Ellis (1962) has noted that much anxiety is the result of irrational thinking and has suggested that such problems can be solved if changes are made in one's internal dialogue (e.g., if negative self-statements are replaced by positive ones). Several studies have largely supported Ellis' hypothesis. For example, Meichenbaum et al. (1971) found that cognitive restructuring based on Ellis' rational-emotive therapy did result in significant reductions in speech anxiety. In another study (Meichenbaum 1972), the effectiveness of a cognitive modification package was compared with traditional desensitization. Subjects having problems with test anxiety participated in an eight-session group treatment utilizing cognitive restructuring and modified desensitization. Included in the program were relaxation training and discussion of potential irrational thoughts underlying test anxiety. Subjects were given imaginal practice in coping with test anxiety by means of relaxation and self-instructions to focus on the test itself. The cognitive modification procedure resulted in greater reductions in test anxiety than the traditional desensitization procedure (based on subjective ratings, performance on an analogue task, and school grades).

Cognitive restructuring has also been applied to the problem of social anxiety. For example, DiLoreto (1971) taught socially anxious undergraduates to re-evaluate the consequences of their behavior in various social situations and eliminate their irrational thoughts. The results demonstrated the effectiveness of the rational-emotive approach and showed that it was at least as effective as systematic desensitization. Kanter and Goldfried (1976) compared cognitive restructuring, self-control desensitization, and both combined. All three conditions produced significant reductions in social anxiety (using behavioral and subjective measures) at the end of training. But two months after training, the students in the cognitive restructuring group did better in terms of anxiety reduction than the students in the other groups. These findings are consistent with those of Holroyd (1976) who found cognitive restructuring to be superior to a combination of cognitive restructuring and desensitization.

Taken together, the evidence discussed above supports the use of relaxation training and cognitive restructuring as a means of reducing several types of anxiety. Progressive relaxation produces in-treatment physiological changes and lowers anxiety when used within the context of systematic desensitization both during and, in many cases, after treatment. However, teaching relaxation as an active coping skill increases its effectiveness and facilitates transfer to other anxiety-provoking situations. Cognitive approaches to anxiety reduction involving specific strategies to eliminate irrational thoughts or replace negative self-statements with positive ones also have been effective in reducing different types of anxiety. Moreover, cognitive restructuring also tends to transfer to situations other than the one targeted during training, and long-term results show that it is at least as effective as self-control relaxation.

PROBLEM-SPECIFIC SKILLS AND KNOWLEDGE

Several recently developed prevention strategies targeted at one or more substances have focused almost exclusively on providing adolescents with skills and knowledge directly related to the problem being addressed by the particular preventive intervention. To a large extent, this type of approach has been based on the pioneering work conducted by Evans and his colleagues at the University of Houston (Evans et al. 1978; Evans et al. 1981) which involved the application of social psychological principles to the problem of adolescent cigarette smoking. Films were developed to make students aware of the various social pressures to smoke which they might be likely to encounter during their junior high school years in order to "inoculate" them against these pressures. In addition to teaching students about social pressures to smoke--particularly that coming from peers--suggestions were made concerning tactics which might be used to resist such pressures.

Other investigators have elaborated on this model, placing more emphasis on the actual training of junior high school students in the use of pressure resistance tactics to deal with peer and media pressures to smoke, drink, or use drugs (Hurd et al. 1980; McAlister et al. 1979; McAlister et al. 1980). Specially trained peer leaders have been utilized to demonstrate the application of these pressure resistance tactics to common situations in which adolescents might find themselves. Moreover, role plays were organized to provide an opportunity for structured practice and feedback in the classroom. Students have also been taught how to identify and formulate counter-arguments against advertising appeals to smoke or drink.

Although there is a growing recognition that abstract knowledge about the negative consequences of substance abuse is of marginal value as a prevention strategy, certain types of knowledge about the use of tobacco, alcohol, and drugs may be a useful component of substance abuse prevention programs. For example, since many observers have noted that adolescents typically overestimate the prevalence of smoking, drinking, and the use of certain drugs, all of the psychosocial prevention strategies (e.g., Evans et al. 1979; Hurd et al. 1980; McAlister et al. 1979) have attempted to correct normative expectations of high substance use in the hope of reducing the perceived social support for these behaviors. Furthermore, since the perceived social benefits of smoking, drinking, or using other drugs may override concern for any potential negative consequences (particularly more distant long-term ones), an effort has been made in many of these prevention strategies to focus on some of the more immediate negative consequences of use which may serve as social liabilities (e.g., nicotine stains on teeth, bad breath, etc.).

In sum, the inclusion of program components designed to teach pressure resistance skills, knowledge concerning the various social pressures to smoke, drink, or use drugs, knowledge concerning the more immediate negative consequences of using these substances, and knowledge about the actual levels of use among both adults and adolescents appears to enhance the effectiveness of prevention programs.

LIFE SKILLS TRAINING AND SUBSTANCE ABUSE PREVENTION

Our own research has involved the development and testing of a broad-spectrum prevention strategy called Life Skills Training (LST). The main purpose of this approach is to facilitate the development of general personal and social skills, with particular emphasis being placed on the development of skills for coping with pro-substance-use social influences. As such, the LST program utilizes several cognitive-behavioral techniques found to be effective in treating a variety of problems. However, within the context of this program, these techniques are being used educationally in order to enhance students' ability to, for example, cope more effectively with anxiety or function more competently in social situations.

Some of the general cognitive-behavioral techniques incorporated into the LST program include cognitive strategies for enhancing self-esteem (e.g., goalsetting, behavior change techniques, replacing negative self-statements with positive ones); techniques for resisting persuasive (advertising) appeals (e.g., identifying persuasive appeals, formulating counter-arguments); cognitive-behavioral self-management techniques for coping with anxiety (e.g., relaxation training, mental rehearsal); verbal and nonverbal communications skills; and a variety of social skills (e.g., initiating social interactions, conversational skills, heterosocial ("dating") skills, complimenting, verbal and nonverbal assertive skills). These skills are taught using a combination of instruction, modeling, rehearsal, feedback and reinforcement, and extended practice through homework assignments.

In addition to providing students with general life skills, this prevention strategy also involves teaching skills and knowledge more directly related to the problem of substance abuse. For example, in addition to teaching students general assertive skills (i.e., the use of "no" statements, requests, and the assertive expression of rights), students are taught how to use these skills to resist direct interpersonal pressure to smoke, drink, or use marijuana. Thus, students are not only taught a wide range of personal and social skills in order to improve their general competence and reduce potential motivations for using one or more substances, but are also taught the application of these skills to situations in which they may experience pro-substance-use social pressure.

Conceptually, the intervention can be divided into five major components: (1) a cognitive component designed to present information concerning the short- and long-term consequences of substance use, prevalence rates, social acceptability, onset process, habit development, etc.; (2) a decision-making component designed to foster the development of critical thinking and responsible decision-making; (3) a component designed to provide students with techniques for coping with anxiety (i.e., cognitive and behavioral self-control strategies); (4) a social skills training component, including both general coping skills and assertiveness techniques which can be used to effectively resist direct interpersonal pressures to smoke, drink, or use drugs; and (5) a self-improvement project designed to provide students with the basic principles of behavior change and to enhance self-esteem.

EVALUATION OF THE LIFE SKILLS TRAINING APPROACH

The initial pilot research with this psychosocial prevention strategy (Botvin et al. 1980) tested its short-term effectiveness for preventing the onset of cigarette smoking when implemented by outside health professionals. This study was conducted with 8th, 9th, and 10th graders (N = 281) from two different schools in suburban New York. Both schools were comparable with respect to SES and baseline smoking rates. Schools were randomly assigned to experimental and control conditions. One school participated in a 10-session prevention program (LST) and the other served as a no-contact control group.

The results of this study indicated that significantly fewer students in the experimental group (4%) began smoking than in the control group (16%) at the time of the initial posttest. Follow-up data (Botvin and Eng 1980) collected three months after the initial posttest indicated that there still were fewer students in the experimental group beginning to smoke than in the control group (6% vs. 18%). Overall, the LST prevention strategy produced a 75% reduction in new cigarette smoking over the three months between the pretest and posttest, which decreased over the three months between the posttest and the follow-up to a 67% reduction.

The second study with this approach involved testing the efficacy of the LST prevention program when implemented by older (11th and 12th grade) peer leaders. The program was tested on 7th graders (N = 426) from two public junior high schools in suburban New York City. Schools were randomly assigned to experimental and control conditions. Furthermore, saliva samples were collected prior to administration of the self-report questionnaire in a variant of the "bogus pipeline" procedure used by Evans and his co-workers (Evans et al. 1977) and to provide an objective measure of smoking status (saliva thiocyanate). Once again the results indicated that there were significantly fewer new smokers in the experimental group (8%) than in the control group (19%). These results were corroborated by the results of the saliva thiocyanate (SCN) levels (indicating increased smoking) for the students in the control group and no significant increase for the students in the experimental group.

One year later these students were posttested again and the two groups compared. Although there were still differences between the experimental (24%) and control groups (32%) with respect to all new smoking, these differences were no longer significant. However, when more regular cigarette smoking (weekly or daily) was examined, significant differences were evident between the experimental group (11%) and the control group (25%). This study demonstrated a 58% reduction in new smoking at the initial posttest and a 56% reduction in more regular smoking at the one year follow-up.

The third study with this prevention approach (Botvin et al. in press) was designed to provide a "real-world" test of this type of smoking prevention strategy when implemented by regular teachers under conditions relatively typical of most classrooms. Seventh grade students from seven suburban New York schools (N = 902) were randomly assigned to three conditions: a treatment condition which involved conducting the LST prevention program once a week for 15 weeks, a treatment condition which involved conducting the LST program several times a week for about 5 weeks, and a control condition. Two schools were assigned to each treatment condition and three schools were assigned to the control group. As in the previous study, saliva samples were collected in order to ensure high quality self-report data.

Comparison of the combined experimental group and the control group revealed significant differences in the proportion of new smokers (6% vs. 13%). No significant differences between the two scheduling formats were apparent at the initial posttest. However, at the one year follow-up it became clear that the more intensive approach was more effective for all measures (monthly, weekly, and daily) of smoking status. Furthermore, comparison of the combined experimental group indicated that it resulted in significantly fewer new smokers using the monthly recall measure (15% vs. 22%), the weekly measure (8% vs. 15%), and the daily measure (6% vs. 11%). Finally, the results indicated that providing students with additional "booster" sessions can help to maximize the effectiveness of the prevention program. Thus, for example, while the best non-booster group had an onset rate for regular smoking of 5% (compared to a 15% rate for the controls), the booster group had an onset rate of only 2%.

Therefore, based on the most inclusive measure of new smoking (monthly smoking), the prevention program resulted in a 50% reduction in new cigarette smoking at the end of the first year and a 55% reduction at the end of the second year for the intensive format condition. Furthermore, new regular smoking was reduced by 87% at the end of the second year for the students who participated in the additional booster sessions.

Research is currently underway to test the impact of the LST prevention strategy on alcohol and marijuana use. Since tobacco, alcohol, and marijuana use not only appear to be promoted by the same etiologic factors but also occur at roughly the same point in the developmental sequence of substance use behavior, it was hypothesized that this type of broad spectrum prevention strategy would also have an impact on alcohol and marijuana use. A secondary goal is to test the relative effectiveness of this type of prevention program when implemented by either older (10th and 11th grade) peer leaders or regular classroom teachers.

The study includes approximately 1200 7th grade students from 10 suburban New York junior high schools. The students in these schools are from predominantly white middle-class families. Two schools were assigned to each of the following five experimental conditions: (1) teacher-led prevention curriculum, (2) peer-led prevention curriculum, (3) teacher-led prevention curriculum plus booster sessions, (4) peer-led prevention curriculum plus booster sessions, and (5) control.

Students in conditions 1-4 participated in the LST prevention program. For two of the four treatment conditions, the prevention program was implemented by regular classroom teachers, whereas older (10th, 11th and 12th grade) peer leaders conducted the prevention program with the students in the other two treatment conditions. Approximately four months after the pretest, all students were posttested by questionnaire and saliva samples were once again collected. In addition, one of the teacher-led conditions and one of the peer-led conditions are participating in an eight-session "booster" program during the 1982-1983 school year. At the conclusion of the school year, students will once again be posttested by questionnaire, and saliva samples will be collected.

Results of the first year of this study (Botvin et al. 1983) indicate that the prevention program had a significant impact on tobacco, alcohol, and marijuana use. The students in the peer-led condition reported drinking significantly less alcohol per occasion than either the students in the control condition or the teacher-led condition. Perhaps most dramatic was the impact of the prevention program on marijuana use. Not only were there significantly fewer students reporting marijuana use with respect to both the monthly and the weekly recall measures, but the magnitude of these differences was quite substantial. Comparing the proportion of students reporting marijuana use in the peer-led condition with the control condition, the prevention program reduced total marijuana use by 71% and regular (weekly or daily) marijuana use by 83%. As was the case in the previous studies, significant changes were also evident with respect to selected cognitive, attitudinal, and personality variables in a direction consistent with non-substance use.

SUMMARY AND CONCLUSIONS

The initiation of substance use typically begins during adolescence and appears to be the result of the complex interplay of social, personality, cognitive, attitudinal, behavioral, and developmental factors. Traditional smoking, alcohol, and drug education programs have attempted to increase students' knowledge of the risks associated with using these substances in the hope that this would deter use. Other programs have attempted to enrich the personal and social development of students through what has been referred to as "affective" education.

Unfortunately, the inescapable conclusion to be drawn from the substance abuse prevention literature is that few of these programs have demonstrated any degree of success in terms of the actual prevention of substance use/abuse. Traditional educational approaches to substance abuse prevention appear to be inadequate because they are based on faulty assumptions and are too narrow in their focus. The "affective" education approaches, on the other hand, appear to have placed too little emphasis on the acquisition of the kind of skills that are likely to increase general personal competence and enable students to cope with the various interpersonal and intrapersonal pressures to begin using tobacco, alcohol, or drugs.

From the perspective of social learning theory (Bandura 1977) and problem behavior theory (Jessor and Jessor 1977), substance use is conceptualized as a socially learned, purposive, and functional behavior which is the result of the interplay of social (environmental) and personal factors. One potentially effective approach to substance abuse prevention might involve enhancing general personal competence and teaching adolescents the kind of problem-specific skills and knowledge which will increase their ability to resist the various forms of pro-substance-use social pressure. Brief reviews of the social skills training literature and the literature related to techniques for coping with anxiety not only provide evidence for the feasibility of teaching these kinds of skills, but also provide guidelines concerning the most effective approaches to use. Similarly, several of the most successful smoking prevention programs have included components designed to increase adolescents' ability to resist the various pro-use social pressures, particularly pressure from their peers.

Our own research has involved testing a broad-spectrum prevention strategy which focuses both on the enhancement of personal competence through the development of basic "life skills" and the acquisition of problem-specific skills and knowledge designed to increase adolescents' ability to resist the various forms of social pressure to engage in the use of one or more substances. Results of evaluation studies conducted thus far indicate that this type of prevention strategy can significantly reduce new cigarette smoking by 50% or more, with the effects of the prevention program being evident up to one year after completion of the program. Furthermore, the preliminary results of an ongoing study, designed to determine the applicability of this prevention strategy to alcohol and marijuana use, indicate that it can significantly reduce excessive drinking as well as regular marijuana use. Finally, in all of the studies conducted to date, this type of prevention program has produced significant changes on selected cognitive, attitudinal, and personality variables in a direction consistent with non-substance use.

RECOMMENDATIONS FOR FUTURE RESEARCH

The results of research with this type of broad-spectrum approach to substance abuse prevention are extremely encouraging. However, a number of important issues need to be examined further. First, some effort should be made in future studies to measure the actual impact of this type of prevention program on the skills being targeted in order to determine, for example, the extent to which students can be effectively taught how to cope with anxiety. Second, virtually all of the substance abuse prevention research, including our own, has been conducted with predominately white middle-class populations; future research needs to be conducted to determine the extent to which this type of program is also applicable to minority populations who are likely to be at high risk for becoming substance abusers. Third, future research should attempt to identify the "active ingredients" of this type of prevention strategy in order to determine whether or not the kinds of general coping skills taught actually contribute significantly to program effectiveness. Fourth, future research should attempt to identify the factors that can either positively or negatively affect program effectiveness. Fifth, this type of prevention strategy should be tested against other competing substance abuse prevention models. Sixth, once one or more effective prevention models have been identified, it will be necessary to learn more about how to insure successful implementation. Finally, once these questions have been answered satisfactorily, it will be necessary to conduct large scale "clinical" trials to determine the effectiveness of this type of prevention strategy when it is implemented with a broad range of students.

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Alternatives to Drug Abuse: Some Are and Some Are Not

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INTRODUCTION

The purpose of this paper is to discuss the current state of the art of alternatives to substance abuse as one of several approaches to prevention. This paper defines four different approaches to prevention that have been proposed and reviews the literature related to each approach. Two recent studies of alternative programs and activities will be presented and the paper will conclude with recommendations for further research.

The concept of alternatives to substance abuse was one of the first responses to the problem (Wald and Abrams 1972). The early advocates of this strategy recommended substituting positive experiences for the experiences reported to be associated with substance abuse. Some early workers in the field were aware that not all alternatives would automatically provide an acceptable substitute for some of the pleasures sought and perceived by drug-using and-abusing individuals. For example, Swisher and Horman (1970) discovered, upon completion of a program for college student leaders, that one individual had been very impressed by the emphasis on alternatives; and even though he was only an experimenter with some drugs, he decided to pursue a viable alternative--skydiving, which may have been a greater health risk.

FOUR MODELS OF ALTERNATIVE PROGRAMMING

It is important to begin by outlining the basic approaches that have been attempted and in some instances evaluated as part of a larger cluster of programming known as alternatives to substance abuse. First of all, programs that are variations of forms of treatment and/or incarceration are not considered to be prevention programs and have not been included in this paper. This type of treatment is often confused with the concept of alternatives as it is applied to prevention. It is important in any discussion on this topic to make a distinction between treatment (after the fact) and prevention (before the fact). Therefore, alternative programming includes planned-for activities that will prevent individuals from becoming abusers or substance-dependent users prior to any significant involvement with substances.

The four models of alternative programming relevant to prevention include the following:

1. Providing specific activities for young people (e.g., operating a radio station)
2. Matching specific types of needs with specific types of activities (e.g., sensory needs met through sensory awareness training)
3. Reinforcing participation in existing alternative activities (e.g., encouraging individuals to develop, expand and involve others in their present interests)
4. Facilitating youth-directed groups in the process of initiating self-selected activities (e.g., Channel One)

Specific Activities

The original model for alternatives to substance abuse has no single identifiable source, but the idea of providing alternative activities for young people was seen as a consensus among prevention professionals in the early 1970's (Wald and Abrams, 1972). This approach often took the form of opening a youth center that provided a unique activity or a specified set of activities for the young people in a community. The assumption behind this approach was that young people could be provided with real life experiences that would be as appealing as the use of substances and would in turn preclude their involvement with substances. Horan (1973) described this assumption as competing reinforcement hierarchies which are very complex and must be considered in the context of specific situations along with interpersonal dynamics.

One of the emphases within this first general model of alternatives was to change the affective-cognitive state of an individual. Weil (1972) was the most notable advocate of this emphasis which he labeled "altered states of consciousness." Weil argued that drug use was in part a natural outgrowth of a child's interest in different states, (e.g., being dizzy). However, one could argue with equal data that children also thrive on maintaining balance (e.g., walking the curb).

As an example of providing a specific activity in the context of prevention, Ventura and Dundon (1974) evaluated an Outward Bound type of program. Their results did not reveal any statistically significant differences, between groups or as a result of the pre- and post-test occasions, but the authors concluded that the participants' self-reports, and behavioral observations of the participants revealed positive changes.

Religious participation as an alternative activity has always fared well in the literature. For example, Bowker (1975), Turner and Willis (1979), and Yohe (1981) all found that greater participation in religious activities was associated with lower levels of use of substances. Similarly, Jessor and Jessor (1977) and Kandel (1978) have also concluded that involvement with religion is associated with less use of various substances.

Matching Need With Alternatives

The second major approach to alternative programming recommended matching alternatives with unfulfilled needs of individuals. While several authorities have advocated this approach, Cohen's model (1971) is the most well-developed conceptualization in this arena. Figure 1 below illustrates four of Cohen's levels of potential unmet needs and alternative activities that would accommodate those needs. A distinguishing feature of this approach to alternative programming is the individualization of activities rather than the provision of a predetermined activity or group of activities. Cohen's model also emphasized addressing underlying causes in a manner that would allow the individuals legitimate expressions of their needs.

Level of Experience	Corresponding Motives (Examples)	Possible Alternatives (Examples)
Physical	Desire for physical satisfaction, physical relaxation, relief from sickness, desire for more energy, maintenance of physical dependency.	Athletics, dance, exercise, hiking, diet, health, training, carpentry or outdoor work.
Sensory	Desire to stimulate sight, sound, touch, taste, need for sensual-sexual stimulation.	Sensory awareness training, sky diving, experiencing sensory beauty of nature.
Emotional	Relief from psychological pain, attempt to solve personal perplexities, relief from bad mood, escape from anxiety, desire for emotional insight, liberation of feeling, emotional relaxation.	Competent individual counseling, well-run group therapy, instruction in psychology of personal development.
Interpersonal	To gain peer acceptance, to break through interpersonal barriers, to "communicate," especially non-verbelly, defiance of authority figures, cement two-person relationships, relaxation of interpersonal inhibition, solve interpersonal hangups.	Expertly managed sensitivity and encounter groups, well-run group therapy, instruction in social custom, confidence training, social-interpersonal counseling, emphasis on assisting others in distress via education, marriage.

FIGURE 1. Examples of Cohen's approach to alternatives

Barnes and Olson (1977) investigated the remedies junior and senior high school students used to relieve negative states or achieve positive states. They gave a questionnaire that listed fourteen remedies (six drug and eight nondrug remedies) and positive and negative states or moods. The negative states were anxiety, depression, and hostility and the positive states were adventure, cameraderie, and pleasure. Their goal was to identify which alternatives were used to achieve and/or relieve emotional states. The nondrug alternatives were physical activity, personal contemplation, discussions with friends or parents, counseling, social activities, and risk-taking behaviors.

One of their major findings was that alternatives used to reduce the negative states were seldom used to achieve positive states and vice versa (Barnes and Olson 1977). Distracting activities, discussions with friends, and personal contemplation were used most frequently to relieve negative states. Social activities, risk-taking behaviors, and physical activities were used significantly more to achieve positive states. The authors also found that illicit drugs and alcohol were used significantly more to achieve positive states than to relieve negative states. They recommended that alternatives should be paired with the state (need) that they have the highest likelihood of facilitating.

Chanin (1969), Dohner (1972), Goodwin (1972), and Floyd and Lotsof (1978) also emphasized alternatives as a means for meeting more fundamental needs. They emphasized providing meaningful experiences w h a somewhat avant garde flavor such as: transcendental meditation, sensitivity groups, yoga, creative and esthetic experiences.

While Cohen's (1971) model has been frequently cited as part of a rationale for alternative programming, there have been no evaluation projects based on the model. Several methodological problems are inherent in evaluating an approach that emphasizes individualization of services. Nonetheless, the need for research on this model remains unfulfilled.

Enhancing Existing Alternatives

The third model of alternative programming involved the application of reinforcement techniques to encourage and expand existing alternative activities in small groups (e.g., Swisher et al. 1972). The process involved discussions with students regarding current nondrug activities which were positively responded to by the group leader. Individuals who were involved in positive alternatives served as role models for the group members who were less involved. The assumption was that it would be possible to increase the overall level of participation in alternatives which, in turn, would reduce involvement with various substances.

This approach was evaluated at the junior high level by Warner et al. (1973), at the senior high level by Swisher et al. (1972), and at the college level by Swisher et al. (1973). All of these studies were true experimental designs with random assignment of students to experimental and control conditions, random assignment of group leaders to experimental and control conditions and pre- and post-testing with reliable and valid instruments. However, this first series of studies concluded the following:

1. Regardless of approach, the knowledge level of participants significantly increased
2. Regardless of approach, the use levels did not change
3. Regardless of approach, the attitudes of students did not change

The most positive finding was among the college students who reported lower levels of use as a function of being in humanistically oriented group processes.

Another study in this series with junior high students (Warner and Swisher 1976) produced a significant and positive change in the students' expressed willingness to try drugs. This particular project involved regular weekly supervision of the group leaders in order for them to function according to the prescribed procedures. The college results mentioned above were also produced as a result of extensive supervision of group leaders. Subsequent attempts to implement this approach without the weekly supervision of group leaders were not successful. The theoretical basis of this reinforcement model was also contrary to the then dominant affective education philosophy in the field of prevention.

Self-Directed Youth Alternatives

The most recent model of self-directed youth alternative prevention to emerge (known as Channel One) follows a seven-step procedure which culminates in youth-directed special projects. The original Channel One formed when artist Al Duca, of Gloucester, Massachusetts, hired a small group of youth to help him with a large statue that he had been commissioned to produce. This same group of young people subsequently elected to restore a historic grave yard, with some financial support from the Gloucester Community Development Corporation. While these projects were being initiated Al Duca began discussions with Prudential Insurance Company regarding the involvement of regional sales managers as consultants to local community groups who would create additional Channel One groups.

The National Institute on Drug Abuse became interested in further stimulating the adoption of Channel One groups across the country, and to accomplish this objective, each Single State Authority was given a special grant (Resnick and Adams 1981).

The Channel One process involves a local prevention professional and a regional sales manager from Prudential (or a representative from another business) who meet to identify community needs. Subsequently community leaders are identified and they form a "steering committee" of adult consultants. The steering committee recruits young people to form "task forces" (Channel One groups) that have responsibility for initiating alternative activities of their own choosing. This self-directed process assumes that young people will elect responsible courses of action and by generating meaningful alternatives they will ultimately become less involved with substance abuse.

Resnick and Adams (1981) reported that, as of May, 1981, there were 3,748 youth involved in 132 Channel One task forces in almost every State in the country. As self-directed groups, 79 have elected vocational skill projects, 44 alternative projects, 19 social service projects, 14 educational projects, 11 historic preservation projects and 5 environmental projects. The Resnick and Adams (1981) survey also revealed that two-thirds of the groups were assisted by businesses other than the Prudential Insurance Company. The involvement of the business community has been viewed as a positive factor in the promulgation of Channel One groups by NIDA.

It is important to point out that 58 of the active 89 Channel One groups reported that they were having serious financial difficulties. This problem highlights one of the missing ingredients in the total replication process. The original Channel One groups were actually hourly employees whereas, the replication groups were assumed to be volunteers. Given the choice of projects listed above, it appears that the participants would prefer income producing alternatives and in the absence of this opportunity the groups will probably disband (Resnick and Adams 1981).

EVALUATION OF CHANNEL ONE

Graefe (1981) conducted a comprehensive process evaluation of a Channel One replication and concluded that the community, parents, and students had positive attitudes toward their experiences. Some data suggested reduced truancy among "active" Channel One members. The evaluation did not include control groups and data on drug use behaviors were not collected.

Hu et al. (1982) conducted the most recent outcome evaluation of the Channel One process. The purpose of their evaluation was to determine the effectiveness and the cost-effectiveness of this type of alternatives programming. A community-based drug and alcohol agency, currently conducting Channel One type groups that had received an incentive grant for the effort, was nominated by a northeastern State as an appropriate site for the evaluation. Even though several Channel One groups were presently operating in the community, the local agency decided to initiate new groups for this project. The groups were initiated at six year-round community recreation centers. Three of the six sites were randomly assigned to an active status (experimental) and three were assigned to an inactive status (delayed treatment control). The Channel One program evaluated by Hu et al. (1982) included the essential components of natural group formation, group interaction, involvement in alternative activities, youth-initiated activities, the opportunity for decision-making, and the necessity for taking responsibility for one's own decisions. Channel One participants identified their own program activities and goals. The evaluation focused on the extent to which Channel One increased participation in alternative activities, improved decision-making and problem-solving skills, improved self-concepts, increased creativity, and reduced substance use.

The outcomes varied across the three sites, with Site 1 becoming significantly more democratic in its group problem-solving. Furthermore, Site 2 became significantly more involved in positive alternatives. There were no significant changes in self-esteem for any site. There were, however, negative findings for Sites 2 and 3. In these sites, use of inhalants and hallucinogens, and the frequency of being drunk increased (Hu et al., 1982).

The costs of Channel One were calculated by including:

1. Costs to the program, such as personnel, transportation, materials and supplies
2. Costs to other organizations, such as space, equipment, and supervision
3. Costs to the participants, such as transportation and equivalent hourly wages

Including the potential wages, the cost per participant ranged from $180 to $214. Excluding potential wages, the cost per participant ranged from $78 to $82. The slight positive findings for improvement in democratic problem-solving and participation in alternatives are offset by the clearly significant increases in the use of selected substances. Therefore, the program was not effective with regard to substance abuse outcomes although there were some other benefits for the participants. Also the social costs for all participants must be considered when judging the program's effectiveness.

The findings of this evaluation indicate that this particular alternative program partially achieved the intended effects on the affective goals of the groups. On the negative side of the ledger, it appears that the process has a negative effect on the substance use levels of the participants.

There were many difficulties encountered in starting the groups, collecting the data (e.g., on one test occasion false data were submitted by two groups members hired to collect the data), and in terms of the adequacy of experimental and control groups. Furthermore, this single study, while making a contribution to the literature on costs and effectiveness of alternative types of prevention programming, cannot be construed to be representative of the 132 Channel One groups that were active at the time.

A RECENT SURVEY OF ALTERNATIVES TO DRUG USE

During the 1981-1982 academic year, the Pennsylvania Department of Education, funded by the Office of Drug Abuse Policy (Pennsylvania Department of Health), initiated a school improvement process. All schools in Pennsylvania were mailed a request for a proposal to participate in a demonstration project. A review panel was established to select the demonstration sites and ten geographically dispersed schools were included. Four regional staff members of the Addictions Prevention Network were given training in administration of the questionnaire and they in turn provided inservice workshops to all of the teachers in the junior and senior high schools participating in the school improvement process. The total sample was approximately 14,000 students in grades seven through twelve.

Instruments

The Primary Prevention Attitude and Usage Scale (PPAUS) consists of nine subscales as follows:

1. Demographic characteristics (four items on age, grade level, sex, and grade average)
2. School climate (four items on feelings about teachers, subjects, classmates, and school in general)
3. Intentions to use scale (twelve items on situations in which an individual would be willing to use different substances)
4. Self-reported use (twelve items on the extent of use of different substances)
5. Extracurricular activities (eight items on the extent of participation in school and community activities)
6. Social behavior (twenty items on positive and negative social behaviors)
7. Prevention variables (eight items on variables that influence use of substances)
8. Intervention preferences (ten items on individuals that one would turn to for help with substance abuse problems)
9. Location of use (one item describing the typical setting for use of substances)

The total scale is seventy-seven items in length and requires approximately thirty minutes to complete. Emphasis is given during the administration of the scale to each individual's right not to answer any offensive questions. Students are also assured of the anonymous nature of the procedure and they are allowed to shuffle their answer sheets.

Reliability for subscales was established by calculating alpha coefficients from existing data for various subscales. These data are listed in Table 1 below. Validity has been established by correlating the rank order of substances reported by students in the norm group with the rank order of substances reported by a national survey of high school seniors. In essence, the rank order of substances in both surveys is in nearly perfect agreement, suggesting high validity for the survey results.

TABLE 1. Reliability for survey subscales

Subscale	Mean	S.D.	R
School Environment	18.4	4.5	.67
Situational Use	26.1	10.4	.89
Self-Reported Use	23.7	11.2	.90
Behavior Scale			
Positive	24.5	5.4	.62
Negative	45.6	7.0	.84
Total	70.0	9.4	.76
Prevention	24.3	4.7	.80

A separate analysis was conducted on those students reporting any use of serotonin. This is a means of detecting individuals who exaggerate their use of substances or merely are careless in filling out the questionnaire. The range of inappropriate answers from the various schools in this group was approximately 3% to 7%.

Table 2 presents the result of a multiple regression analysis for data collected from the 1981-1982 participating schools. A regression was calculated for the extent to which the use of that substance is associated with the types of items found in the questionnaire. For example, all of the factors listed down the left-hand column are analyzed in terms of their association with the use of cigarettes. The factors that are significantly (*p* less than .05) related to use of cigarettes are given a descriptive label, such as "less." This would be interpreted to mean that the less time students spend participating in sports, the more they smoke cigarettes. In order to understand the chart, it is necessary to verbalize each statement. In the example above, the statement has a logical quality and is not difficult to understand. However, some of the statements may require a review of the questionnaire in order to fully understand the interpretation.

In all cases, if a word (such as more, less, higher, lower) is present in the table, it indicates "more use" of the substance under which it is listed. If there is no word listed, this indicates that the factor was not significant. However, no individual factor should be considered as extremely important. The weight of each factor is minimal, but if a pattern shows up (e.g., females consistently listed across the top), this would indicate a need for focusing on educational materials with a female point of view.

The following conclusions regarding alternatives can be drawn from the regression model presented in Table 2.

1. Entertainment activities are significantly associated with use of cigarettes, beer, marijuana, inhalants, depressants,and stimulants.

2. Academic activities are associated with less use of beer, marijuana, and stimulants.

3. Participation in sports is associated with less use of cigarettes, marijuana, depressants, hallucinogens, and stimulants; however, sports were significantly associated with more use of beer.

4. Participation in social activities was associated with more use of everything.

5. Involvement in religious activities was associated with less use of cigarettes, beer, marijuana, and stimulants.

6. Active hobbies were associated with less use of beer and stimulants.

7. Participation in extracurricular activities was associated with more use of cigarettes, beer, marijuana, inhalants, depressants, and stimulants.

8. Participation in vocational activities was associated with more use of all substances in the questionnaire.

TABLE 2. Alternative activities and factors influencing use of substances in 1981-82 school year

Factors	Substances						
	CIG	BEER	MARJ	INH	DEP	HALL	STIM
Gender	Girl	Boy					
Grade		High	High				High
Average	Low		Low				
Entertain	More	More	More	More	More		More
Academic		Less	Less				Less
Sports	Less	More	Less		Less	Less	Less
Social	More	More	More	More	More	More	More
Religion	Less	Less	Less				Less
Hobbies		Less					
Extra	More	More	More	More	More		More
Vocation	More	More	More	More	More	More	More
r^2*	.325	.383	.371	.090	.140	.123	.258
N	13,915	13,931	13,946	13,960	13,949	13,949	13,949

*Other variables in the regression model also contributed to the r^2 (e.g., how students feel about school).

CONCLUSIONS AND RECOMMENDATIONS

One apparent conclusion from this review of research on alternative programming is that there is a sparse evaluation literature and uneven correlational literature upon which to base any conclusion. During the last decade ten thousand studies have appeared in the professional literature involving the MMPI (Anastasi 1980). One is hard pressed to find one percent of that record for the entire field of prevention.

Schaps et al. (1981), in a comprehensive review of 127 outcome studies of all types of prevention programs, found only twelve studies of alternative programming. Seven of the 12 studies reported no program impact on participants. The other 5 studies had positive outcomes which resulted in alternative programming being second in positive effects among ten other approaches to prevention. These successful programs suggest some merit for the alternative approach, but more importantly they do not represent an adequate data base for planning.

Programs such as Channel One should be more thoroughly evaluated prior to mass dissemination efforts. Apparently, neither the initiation nor termination of Channel One benefited from an adequate data base.

There is a need for additional research in this domain. Instead of discarding what has been learned, research should further explore what types of alternatives in what kinds of agencies and institutions have a constructive effect on what types of individuals. The research cited in this paper supports the fact that some alternatives detract from drug abuse (e.g., academic, sports, and religious) whereas, other alternatives contribute to the use of various substances (e.g., social, entertainment, and vocational). More basic longitudinal research on underlying psychosocial dynamics needs to be explored regarding these behavioral manifestations.

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Empirical Foundations of Family-Based Approaches to Adolescent Substance Abuse

Brenna Bry, Ph.D.

It is difficult to imagine investigating any approach to substance abuse prevention without a thorough knowledge of etiology. Otherwise, intervention goals would be arbitrary and methodology selection guesswork. Accordingly, this discussion of family-based approaches commences with the author's understanding of substance abuse precursors, how they combine, and what processes affect problem use. Then evidence is presented that family involvement can indeed reduce substance abuse precursors and early signs of abuse. Finally, questions are raised about the necessary and sufficient conditions for family involvement in prevention efforts.

PSYCHOSOCIAL PRECURSORS: POTENTIAL TARGETS FOR PRIMARY PREVENTION

Adolescent substance abuse is multiply determined, as are all complex behaviors. Recent research has uncovered some of the following psychosocial precursors:

(1) Poor parent-child relationships is a common finding (Blum and Associates 1970; Streit 1973). In a recent study, Hendin et al. (1981) found that marijuana abuse was often preceded by estrangement from parents due to unrealistic expectations or withdrawal of love on the part of the parents. In addition, (2) low self-esteem (Kaplan 1977), (3) psychological disturbance such as depression (Paton et al. 1977), (4) low academic motivation (Smith and Fogg 1978), (5) other problem behaviors (O'Donnell and Clayton 1979), (6) low religiosity (Tennant et al. 1975), (7) high experience seeking (ES) (Zuckerman et al. 1970), (8) high family misuse of substances (Kandel et al. 1978), (9) high peer substance use (Kandel et al. 1976), and (10) early cigarette use (Tennant and Detels 1976) all have been found to increase the probability of substance abuse.

REDUCING COMPLEXITY: HOW THE PRECURSORS COMBINE

Such an extensive array of precursors led researchers to use multivariate methods to reduce the complexity and search for the most important causal dimension or subset of precursors. Each study, however, identified a slightly different subset of precursors, ranging from (a) rebelliousness, poor academic performance, and early cigarette smoking (Smith and Fogg 1979), to (b) peer and parent behaviors (Kandel et al. 1978), to (c) high concern for independence and high tolerance for transgression (Jessor and

Jessor 1978), to (d) perceived distance from parents, high psychological disturbance, and low self-esteem (Pandina and Schule, in press), to (e) high experience seeking and a "hang loose" life style (Segal et al. 1980a).

Bry (1983) suggests an alternative model that simultaneously reduces the complexity and recognizes the potential importance of all 10 above precursors. She proposes multiple pathways to substance abuse; each individual abuser may have his or her own unique combination of precursors. According to Bry, the important dimension in predicting individual substance abuse is the number of precursors, instead of a particular set of them. Stated differently, the more predisposing factors a young person must deal with, the more likely he or she is to cope by abusing drugs.

Two cross-sectional tests of this multiple risk factors hypothesis have been completed and a prospective test is in progress. Figure 1 shows the results of testing the hypothesis on a data set containing six of the above ten precursors, or risk factors. The results reveal a highly significant relationship between number of precursors and probability of current substance abuse (Bry et al. 1982). In figure 1, the magnitude of risk of 1.00 represents the base rate of substance abuse in the population studied, which was 11 percent in this case. Subjects exhibiting none of the risk factors reported a lower percentage of substance abuse than the population at large. The presence of each additional risk factor is associated with a higher percentage of abuse, until the presence of four risk

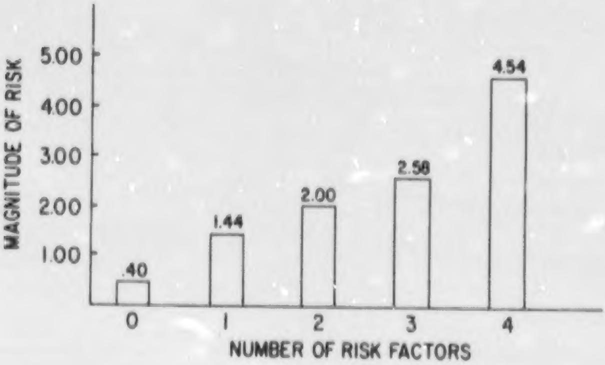

FIGURE 1. Relationship between probability of reporting current substance abuse and number of risk factors exhibited by individual adolescents in the general population (Magnitude of risk of 1.00 = base rate for population)

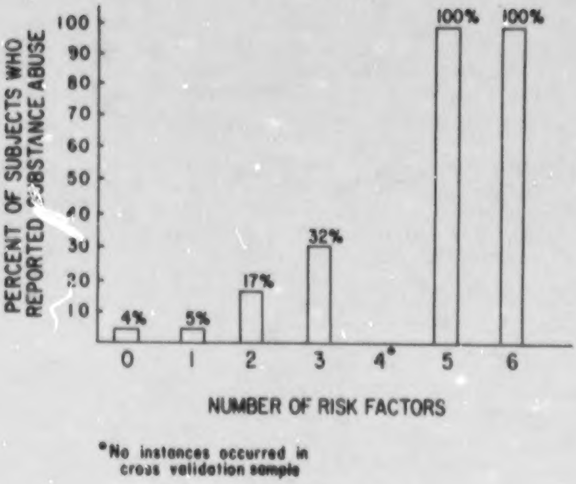

FIGURE 2: Relationship between probability of reporting current substance abuse and number of risk factors exhibited by individual adolescents in the general population

factors is associated with a four and a half times increase in magnitude of risk, or a 50% chance of reporting substance abuse.

Figure 2 shows the results of a study including all ten of the above-described etiological factors. As you can see, 100% of those subjects who exhibited 5 or 6 risk factors also reported current substance abuse upon cross validation (Bry and Pedraza 1983).

It is important to note that the relationships shown in figures 1 and 2 are not accounted for by one predominant combination of risk factors. In figure 1, 24 different combinations occurred among the 156 subjects who exhibited 2, 3, or 4 risk factors, and none of the combinations accounted for more than 20% of the cases.

Table 1 shows that the results of the study whose findings are represented in figure 2 are not accounted for by one set of risk factors. Among the six exemplary subjects shown, no two subjects has the same combination of risk factors. The fact that early cigarette use is more highly represented in table 1 than low religiosity does not suggest that one is a more predictive risk factor than another, for the base rate of early cigarette use is much higher in the non-substance-abusing population than is low religiosity. These results suggest, as others have hypothesized, that there may be almost as many salient combinations of etiological variables as there are substance abusers (e.g., Nathan and Harris 1980).

TABLE 1

Combinations of Risk Factors Represented Among Substance Abusers in a Cross-sectional Test of the Multiple Risk Factors Hypothesis

SUBJECTS	LO ACAD	LO RELIG.	HI ES	EARLY CIG USE	HI PSY. DISTRES	HI CRIM. BEHAV	HI STRESS LIFE EV	LO PARENT NURT/CONT	HI PEER USE	HI PARENT USE
1			X	X			X			
2	X			X					X	
3		X	X						X	
4			X	X				X		
5	X	X	X	X					X	X
6	X		X	X	X	X				

Brook et al. (1983) recently reported findings that are consistent with the notion of multiple, independent pathways to substance abuse. They found evidence that family precursors, personality precursors, and peer precursors operate independently, instead of interdependently, in the etiology of substance abuse. The presence of precursors from just one domain is a sufficient condition for adolescent substance abuse, even in the absence of precursors from other domains (Brook et al. 1978).

IMPLICATIONS FOR PREVENTION

This notion that causal factors combine non-linearly and uniquely in each individual is not surprising if one views substance abuse as a complex behavior governed by the same laws that govern other behaviors, for most behaviors have different determinants for different people. This conceptualization however has implications for the development of substance abuse preventive interventions. It suggests that no single modality, no "most effective" prevention program, will be found. Multiple causation calls for multifaceted prevention programs, perhaps a different approach for each psychosocial precursor.

Besides supporting a policy of multiple prevention programs for reducing multiple risk factors, these findings also support the feasibility of identifying a high-risk population at which to aim primary and secondary prevention efforts. This assumption received empirical support in Bry (1982), where young people who had been identified in 1973 as exhibiting at least two of the substance abuse risk factors and who received no preventive intervention were found in 1980 to have experienced far more alcohol use, marijuana use, arrests, and school failure than was expected in a normal group of adolescents.

PROCESSES AFFECTING SUBSTANCE USE

Family approaches to substance abuse prevention can benefit from knowledge of not only precursors and how they combine, but also processes that determine substance use. Research into these processes generally has been done outside of the prevention field. Operant conditioning, generator schedules, modeling, and expectancies all have been shown to influence substance use.

Operant Conditioning: Behavior is a Function of its Consequances

Behavior is clearly influenced by its consequences. Animal research has confirmed what users and practioners already knew -- that substances are powerful positive reinforcers. In laboratory situations, animals will perform complicated series of tasks in order to receive most of the same substances that humans abuse (Thompson 1981).

Substances can also produce negative reinforcement effects, i.e., they can lead to the termination of an aversive situation. Reasons subjects give for substance abuse constantly fall into two distinct clusters: (a) to increase positive affect or (b) to decrease negative circumstances such as pain, anxiety, fear or guilt (Mello 1978; Pervin 1981; Segal et al. 1980b).

Substances can further be secondary reinforcers -- becoming reinforcers through their association with the obtaining of other primary reinforcers. Drugs can maintain the company of desired companions or maintain responses from otherwise unresponsive parents (Crowley 1972).

Of importance for prevention programs is that substance use is not only increased by positive effects but also decreased by negative ones. Human substance intake varies inversely with its cost (Nurco 1979). People drink less, for instance, when access to social situations is made contingent upon limited intake (Stitzer et al. 1981). Cocaine users cease use when it is clear that they will lose their professions if they continue (Helfrich and Crowley 1982). Family approaches to substance abuse prevention will profit from taking reinforcement contingencies into account.

Generator Schedules: Restricted Access to Reinforcement can Cause Excessive Behavior

Primary and secondary consequences are not the only environmental events that produce substance abuse. Falk (1981) has shown that restricted, intermittent reinforcement in a valued domain, such as earning money, can produce excessive behavior in another entirely different domain, such as drug use. He calls the excessive behaviors adjunctive behaviors (Falk 1971), and he calls the sparse, intermittent schedules generator schedules (Falk, in press). For instance, subjects whose access to earned coins was temporally restricted drank excessively from an available water fountain while they were waiting (Kachanoff et al. 1973).

There are many aspects of adolescents' lives that are characterized by generator schedules -- waiting for school busses, holding non-challenging jobs, sitting through boring classes, waiting for their next allowance, having "nothing to do," being lonely. If the environment has few other valued alternatives and if drugs are available, excessive drug use can result. In a thoughtful analysis, Falk (in press) proposes that preventive approaches both (a) alter generator schedules and (b) enrich the environment with more socially acceptable alternatives for excessive behavior, such as exercise bars, running trails, basketball hoops, musical instruments, art supplies, and challenging education and jobs. Family approaches to prevention could include both of these strategies. Implementation could bring rapid results, for schedule-induced excessive behaviors have been shown to be a function of only current reinforcement schedules.

Modeling: Behavior is a Function of Others' Behavior

In contrast to the above processes, there is a considerable amount of understanding about the role modeling can play in human substance use and the conditions that increase and decrease its effects (Collins and Marlatt 1981). The use patterns of independent models, particularly of warm active peers, influence amounts of substance ingestion both in the presence of the model and afterwards. There is evidence that this effect occurs even when subjects have been told that an attempt is being made to influence their drinking behavior (DeRicco and Garlington 1977). Modeling, particularly of responsible use of the communication skills necessary to say "no," of coping with adversity, and of choosing alternative activities, can be an important process in family-based prevention approaches.

Expectancies: Behavior is a Function of Expectancies Regarding its Consequences

As Alford (1981) points out, often external stimuli such as reinforcers and models do not directly cause behavior. Instead, they create conditions under which the adolescent "perceives," through reinforcement history or anticipatory expectancy, that one course of action will be more rewarding or less punishing than another. Expectancies, therefore, are important in the initiation and maintenance of adolescent substance abuse.

Southwick et al. (1978), for instance, found that heavier drinkers expect greater stimulation and pleasure from alcohol than do lighter drinkers. Among adolescents, Christiansen and Goldman (1983) report that, in contrast to social drinkers, young people with alcohol-related problems are significantly more likely to expect alcohol to improve their cognitive and motor functioning. They are significantly more likely to endorse items such as "alcoholic beverages make parties more fun," "people drive better when they are drinking alcohol." In another study, Christiansen et al. (1982) found that adult-like expectancies about alcohol were already established at the beginning of adolescence, before the majority of young people had experienced alcohol consumption. Such findings point directly to the family as a potential shaper of expectancies.

FAMILY CONTRIBUTIONS TO THE REDUCTION OF PRECURSORS IN SCHOOL- AND MEDIA-BASED APPROACHES

Given the amount of potential influence that families have upon adolescent behavior, it is noteworthy how seldom their impacts in primary prevention have been measured. The following three research programs, however, all evidence that family involvement is very important, if not essential, for positive outcomes in programs designed to reduce substance abuse precursors.

In a study of the impact of the media on the precursor, cigarette use, Flay et al. (in press) compared the impact on junior high students of (a) a combined school and media smoking prevention/cessation program with written homework assignments to complete with parents and (b) no special school or family homework component (controls still received traditional health curriculum and could watch the TV segments). Preliminary results indicated that, although there were not great differences in knowledge between the two groups, there were significant differences in beliefs and behaviors. The full program students were only half as likely as control subjects to start smoking during the 2 months between the pre and post tests (7% vs. 14%, respectively). Perhaps equally as significant, were the findings that of all the smoking parents who viewed the smoking cessation segments of the program, 69% attempted to quit or reduce smoking, and 35% quit successfully.

Not only does Flay et al. (in press) report significant reduction in an important precursor -- cigarette use, they also report, in another paper (Flay et al. 1982), direct measurement of one of the processes that has been shown to influence substance abuse -- expectancies. Apparently adolescents usually overestimate how many other adolescents smoke at least once a week. The actual level is 10%. Before the program, most of both the program and control students overestimated that percentage greatly. After the program, a significantly lower number of the program students overestimated, while the controls continued to overestimate. For adolescents in particular, it is easy to imagine how developing a new expectation that they will be an "oddball" if they smoke could influence them to delay or to avoid cigarette smoking altogether.

The other process that may well have been determinant of the behavioral outcome was not measured -- modeling. Even if all of the parents who initially quit smoking do not remain abstinent, they have modeled for their children some at least temporarily successful methods for coping with an intractible habit. In the future, it would be interesting to assess more directly the relationship between parental modeling and their children's abstinence behavior. In addition it would be interesting to investigate the family involvement separately from that of the special school program.

Blechman et al. (1981) looked more closely at the impact of family vs school-only involvement with a dismantling design while investigating the reduction of another precursor -- low academic motivation. The researchers identified children in the second through sixth grades with very inconsistent grades on their math homework and assigned them to one of three preventive interventions: (a) teacher home notes and family problem-solving training,

(b) teacher home notes alone, or (c) no intervention control. Then, during the major part of a school year, Good-News notes were sent home for students in the two intervention groups on every day math homework was at least 85% correct. In addition, families in the home note plus family problem-solving intervention came to a university clinic for one hour before the note system began to write contingency contracts about the rewards their child would receive for Good-News Notes. The contracts stated when the reward would be given, how often, and by whom. The families were guided through the contract writing by a 15-minute "Solutions" board game developed by Blechman (1980). Following the visit to the clinic, families in this intervention received calls from program staff every week to check on contract compliance and to remind parents to say nothing about the rewards on days when no note came home.

The family problem-solving training proved to be essential to broad success in this intervention. Whereas children in both the control and home note conditions became less accurate in their schoolwork as the year progressed, the children in the family problem-solving condition maintained their accuracy. This preventive effect also generalized to non-math schoolwork.

Operant conditioning appears to be a salient process in this reduction of poor academic motivation. The contingent feedback of the home notes was not enough to have broad impact; family-based, consistent, mutually agreed upon rewards were necessary. Although they were not measured, one wonders if expectancies and modeling processes were also involved. The children's expectancies regarding the impact of their homework behaviors may have changed and the children's homework accuracy may have been improved by observing parents' accuracy in providing the rewards.

Family involvement also proved essential for another year-long school-based intervention with poor academic motivation as its target. Bien and Bry (1980) identified 40 seventh graders with at least two substance abuse precursors and randomly assigned them in a dismantling design to one of four experimental groups: (1) no intervention control, (2) regular goal-setting teacher conferences, (3) teacher conferences and weekly group meetings where students received rewards for meeting teacher goals, and (4) teacher conferences, group meetings, and regular telephone or letter contacts with parents to inform them about progress in school and encourage them to recognize progress at home. At the end of the school year, only the group with regular family contacts had grades and attendance that were significantly better than the no intervention group's. (See figure 3.) Everyone else declined, while subjects in the combined teacher, group, and parent intervention maintained their grades and attendance from the sixth through seventh grades.

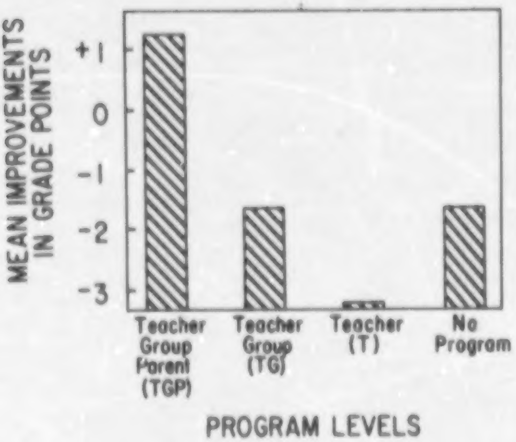

FIGURE 3: Impact of family involvement in a school-based prevention program for high risk seventh graders upon improvement in grades from sixth to seventh grades.

No precursors or processes other than academic motivation and operant conditioning were measured in the Bien and Bry (1980) study, but subsequent studies of the same intervention included measures of other precursors and processes. Bry (1982) did a 5-year followup (after a 2-year intervention) and found that juvenile justice involvement was also reduced. Another finding -- increased summer employment -- may represent an increase in positive adjunctive behaviors incompatible with substance use, but this is a post hoc interpretation. Changes in expectancies and self-esteem were found to accompany the behavior changes in another study of the intervention by Bry and Witte (1982). Specifically, subjects increased their expectancies that they could determine what would happen to them (through their own actions), in contrast to their being determined by external, uncontrollable events. No measures of possible modeling effects were taken, however.

FAMILY-BASED APPROACHES TO THE REDUCTION OF PRECURSORS (PRIMARY PREVENTION)

Parental modeling is specifically programmed in two particular family-based preventive interventions designed to reduce poor parental-child relationships. Guerney et al. (1981) compared the effects of three months of parent and teen-ager communication skills training in groups (Relationship Enhancement) with an equated traditional group discussion intervention and no treatment controls. Whereas the traditional group discussion format increased quality of parent-child relationships over the control group on three of five measures, only the Relationship Enhancement training increased (a) quality of parent-child relationships on all five outcome measures, (b) increased proficiency and satisfaction in general communication patterns, (c) increased expressive skill ("I" statements), and (d) increased empathic skill in lower class, non-client volunteer mothers and daughters. Ginsberg (1977) achieved similar findings with fathers and sons. Modeling and expectancies (re: family relationships) seem to be the salient processes.

Robin (1981) contrasted the impact of seven sessions of specific cognitive-behavioral problem-solving and generalization training with that of traditional family therapy upon number of parent-teen conflicts at home and specific communication behaviors in media-recruited parents and adolescents. Both traditional short-term family therapy and the Problem-solving Communication Training decreased the number of conflicts at home up to 3 months after the intervention, but only Problem-solving Communication Training significantly improved problem-solving communication behaviors.

Given the importance of modeling in determining adolescent behaviors, it is interesting that parents tended to emit a greater proportion of the problem-solving behavior than the adolescents, even though parents and adolescents were equivalent in other communications behavior. It is also significant for the development of prevention programs, where parents must volunteer to participate vs. being forced, that Robin's parents preferred the problem-solving training to the short-term family therapy.

For decreasing the precursor of other problem behaviors, family-based approaches have been developed and tested by Patterson (1974) and Alexander and Parsons (1973). Patterson teaches parents or teachers of elementary school-aged conduct-disordered boys to re-program the social environment through contingency contracting so that the cost associated with problem behaviors exceeds the benefit for the young person. Both parent reports and objective observations reveal significant improvement in boys so treated. These effects are maintained for at least 12 months, for Patterson and Fleischman (1979) report that 82-84% of the subjects' behavior is still within normal range at that time.

They also discuss what processes may be involved in such reduction of a precursor of substance abuse. They suggest that negative reinforcement will maintain parental behavior changes (just as the parental behavior changes maintain the boys' behavior changes) as long as the costs of the child's problem behaviors exceed the cost to the parent of maintaining consistent contingencies. Patterson and Fleischman speculate that failures in improvement maintenance are caused by floods of family crises, such as job loss, separation, or depression, that together have higher aversive inputs than the negative behavior of the boy. They also report that expectancies regarding both family functioning (Patterson and Reid 1973) and their own self-efficacy improve in trained mothers, suggesting that changed expectancies play a role too.

Alexander and Parsons (1973) report similar positive effects of family training in contingency contracting in reducing and preventing behavior problems of adolescents for 6-18 months and 2-1/2 - 3-1/2 years following treatment (Klein et al. 1977). As was true in the Robin (1981) and Guerney et al. (1981) studies, Alexander and Parsons (1973) found the effects of a specifically structured family intervention to be significantly more positive in reducing substance abuse precursors than were those of traditionally implemented family therapy. Consequently, the positive results are not merely due to the inclusion of the family per se, but of, in each case, specific training to change processes (reinforcement, modeling, and expectancies) that play a role in the development of adolescent risk factors.

FAMILY-BASED APPROACHES TO THE REDUCTION OF EARLY PROBLEM USE (SECONDARY PREVENTION)

The above technologies are all primary preventions, for they address substance abuse precursors. As the primary socializing agent, the family can also be influential and perhaps essential in secondary prevention, i.e., intervention applied early in the problem development process. Szapocznik et al. (in press) compared short-term conjoint versus one-person family therapy in reducing early substance abuse in 37 Miami Hispanic-American adolescents. Both interventions reduced substance use by the end of treatment, but the one-person family therapy maintained the gains better at 6 and 12 month followup.

Szapocznik's study is particularly interesting for this discussion because they examined processes. They found that the members of the group whose substance abuse remained low also increased their perception of family cohesiveness, suggesting that Szapoznik's technique of training the teenager to go home and take actions to improve his/her family environment reduced substance use, through at least one of the above-mentioned processes, through increasing the adolescent's expectancies regarding family closeness.

This approach is promising and deserves further study. In 1982, Fishman et al. outlined several advantages that family-based secondary prevention approaches with adolescents have over the treatment of fully developed addictions:

Physiological addiction is not present. The peer subculture is less important in relation to the families at early stages. There is less involvement with the criminal justice system and thus less need to coordinate interventions with interventions of multiple social control systems. Schools are usually the primary social system besides the family in secondary preventive interventions. The family is also able to exert much more control and positive influence in early intervention, both in recruiting the client for intervention and in bringing about changes through changing themselves.

FINAL WORDS

Of course, family involvement in any preventive intervention requires new behaviors on the part of families. I predict that the greatest need for knowledge in family-based interventions will be in the determinants of family involvement in interventions. Most research to date involves families who either (1) voluntarily answered media announcements or (2) agreed to participate after being approached by a school or clinic. What community changes, such as those reported by Maccoby et al. (1977), TOUGHLOVE (York et al. 1982), and the DeKalb (Georgia) Families in Action (Experiences in Collaboration 1982), does society need to construct to increase the number of families who will volunteer and agree to participate? Research so far strongly suggests that when families do become involved, precursors can be reduced, salient processes can be altered, and even early signs of problems can be turned around, but the conditions under which families will take such steps are still largely unknown.

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A Value Approach to the Prevention and Reduction of Drug Abuse

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Are the values of those who abuse drugs any different from the values of those who do not? If so, can the values of drug abusers be changed by intervention or therapy, and would changing such values lead to a reduction or alleviation of drug abuse? And can the values of the latter--of those who do not abuse drugs--be strengthened, reinforced, or stabilized in such a way as to prevent the onset or initiation of drug abuse? My purpose in this chapter is to present theoretical considerations and to review research findings that would support the feasibility of a value approach to drug abuse. Unlike a behavior modification approach, which would focus attention mainly upon the extinction or reduction of drug abuse, and unlike an inoculation approach, which would focus attention mainly upon its prevention, a value approach attempts to focus attention simultaneously on both prevention and reduction. This is done by attempting either to change the strength of those values that are identified as underlying undesirable behaviors or by attempting to strengthen, reinforce or stabilize those values that are identified as underlying desirable behaviors.

BELIEF SYSTEM THEORY

More generally, a value-focused approach may be considered to be a part of a more comprehensive theoretical conception about the nature or structure of belief systems, the conditions under which belief systems will remain stable (because they are functional), and the conditions under which they will undergo change (because they are dysfunctional). The point of departure of a value approach to drug abuse, or to the modification or prevention of any other behavior considered to be undesirable, is based at least upon the following four assumptions: first, that a person's social behavior is, at least in large part, regulated or controlled by the structure and content of one's total belief system; second, that a person's values are centrally, strategically located "deep structures" within one's total belief system; third, that a change in such "deep structures" will lead to changes in value-related beliefs, attitudes, and behaviors; and fourth, that the main functions of individual belief systems are to maintain, and if possible to enhance, conceptions (to oneself) and presentations (to others) of the self as a competent and moral self.

All the preceding is, however, too general or abstract to be scientifically or operationally useful. A more detailed theoretical statement about a theory of stability and change in belief systems is presented in a forthcoming volume (Ball-Rokeach et al. in press) and, given the space limitations imposed upon this volume, a briefer version of this theory, which provides the rationale for a value-based approach to the reduction and prevention of drug abuse, is presented in this introductory section.

Belief system theory can be viewed as a type of cognitive consistency theory wherein the main postulated motive is maintaining and enhancing self-esteem rather than consistency (Rokeach 1968a, 1973, 1980). Put another way, humans behave in a manner that is consistent with their need to maintain and enhance self-esteem rather than in a manner that is consistent with their need for consistency. Such a view about the central motivational role assigned to self-esteem maintenance and enhancement is, I believe, now widely shared not only by other contemporary consistency theorists (Aronson 1968; Greenwald and Ronis 1978), but also by social learning theorists (Bandura 1977), and by symbolic interactionists and self-theorists (Rosenberg 1979; Gecas 1982). The current theory--about the conditions leading to stability and change in belief systems--has undergone continual elaboration and modifications since it was originally proposed (Rokeach 1968a, 1968b), and it differs from my earlier formulations, and also from other theoretical formulations, in that it attempts to be not only a theory of cognitive and behavioral change, but also of cognitive and behavioral stability. That is, it attempts to address itself not only to the motivations that people might have to undergo change, but also to the motivations they might have to maintain the stability or continuity of their cognitions and behavior. We thus come to suggest that both stability and change of belief systems (organizations of beliefs, attitudes, and values) are motivated by the same universal need that humans everywhere have for self-maintenance and self-enhancement. We proceed on the assumption that a person will voluntarily undergo lasting changes in values, and in value-related attitudes and behavior, and, moreover, that he or she will resist such changes for identical reasons, namely, to maintain or to enhance self-esteem. Maintenance implies a motivation not to lose whatever level of self-esteem one presently has, and enhancement implies the presence of a less-than-altogether-satisfying existing level of self-esteem about one's competence or morality, and thus a motivation to improve upon it, in order to reach some higher level of self-esteem. Thus, whereas self-maintenance conjures up a model of a human being striving merely to return to some earlier state of balance, consistency or homeostasis, self-enhancement conjures up a model of a human being striving, beyond such states, for what Rogers (1961) called growth, what Maslow (1970) called self-actualization, and what Goldstein (1963) called self-realization. Thus, our model of human nature is one that assumes that all humans will attempt to maintain their self-esteem whenever they are in fear of losing whatever level of it they might have, but will push on to *enhance* their self-esteem whenever they can afford to do so. We see here a close analogy between the idea of maintaining and enhancing self-esteem and maintaining and enhancing one's bank account. Whether I am a Rockefeller or on welfare, I will attempt to hang onto whatever money I happen to have in my bank account, and to the extent I can afford to, I will try to enhance my bank account by maximizing the interest it might earn.

Further, it is important to distinguish between two major components or sources of self-esteem: *self-conceptions* and *self-presentations*. The former refers to beliefs about our competence and morality that we have about ourselves in the privacy of our thoughts, quite apart from and even despite what others might think of us. We assume that when people think about themselves in the privacy of their rooms, they will generally be somewhat less ego-defensive, less in need of rationalizing, less self-deceptive, and more predisposed to engage in realistic self-appraisals than when they present themselves to others.

But people's self-esteem derives not only from what people think of themselves, but also from appraisals of what others think of them. Even when we consciously fall short of our own ideals and aspirations (e.g., "I am not as smart, competent, attractive or moral as I would really like to be"), we are typically motivated to present ourselves to others as appearing so (e.g., "Even though I know I am not as smart, as competent, attractive or as moral as I would like to be, I would like you to think so, and I will therefore present myself to you so that you will think of me as smarter, more competent, more attractive, or more moral than I really am"). The more others think well of us, the greater our self-esteem will be, regardless of what we might think of ourselves. Moreover, we assume that under conditions of presentation of self to others, feedback of information about oneself (e.g., informing a student he or she has an I.Q. of 90) will more often be accompanied by ego-defense, denial, or rationalization than under conditions of privacy.

We believe self-conceptions and self-presentations to have their origins in *societal demands* on the one hand and in *individual needs* on the other. All societies make demands for competence and morality upon all individuals who, through processes of socialization, internalize such demands and eventually, as society's agents, make such demands upon others (e.g., their children, their students, their parishioners). Societal demands for competence and morality are not arbitrary demands because they dovetail with individual drives for competence and morality. The functions of such societal demands and individual needs complement one another: to provide the person with a self and social identity and to maintain and enhance the person's self-esteem.

Societal demands for competence and morality must be communicated by the agents of society's social institutions to succeeding generations. We suggest that the language employed to communicate such demands is the language of values--distinctive words or symbols that convey shared conceptions of the desirable. If value words were altogether eliminated from language, no one would be able to know what demands to make upon others or upon himself. Through the language of values, the agents of society and its social institutions (e.g., the family, the school, the church) are able to convey societal demands for competence and morality to succeeding generations. Such values, in turn, become internalized as standards for judging one's own and others' competence and morality. We thus see that values serve a dual purpose: on the one hand, they are the cognitive representations of societal demands for competence and morality; on the other, they are the cognitive representations of individual needs. However selfish or anti-social individual needs may be, needs become cognitively transformed into values that can then be justified, defended, exhorted and transmitted to succeeding generations. Individuals are then able, through such cognitive transformations, to end up perceiving that their individual needs do indeed conform to societal demands.

Mindful of philosophical distinctions, we conceive of two qualitatively different kinds of values: those representing desirable end-states of existence--terminal values--and those representing modes of behavior--designed to achieve desirable end-states--instrumental values. Such values are not held in an absolute all-or-none manner but are organized into value hierarchies, that is, rank-ordered priorities. We assume that there are individual, group, cultural, and societal differences in value hierarchies, and we moreover assume that they can be measured. Such prioritized hierarchies are assumed to be relatively enduring, but not so enduring that they cannot undergo change. Any demonstrable change of priority in any given value, when compared with other values, can be taken to represent a change in such a given value. Because individual values are typically embedded in value hierarchies rather than existing in isolation, and also because different situations activate different subsets of a person's total value hierarchy, he or she is continually forced in everyday life to compare the relative importance of any given value with others that might be activated by a given situation, or that might be activated by a larger change in the social milieu within which one is embedded. It is important to emphasize, to those who have always assumed that values, once formed, are stubbornly resistant to change, that it is such a process of continual comparison of the importance of one value with another that makes values, paradoxically, so vulnerable to change, that is, to change in priority.

It is reasonable to assume that values and value systems are central components of total belief systems (Rokeach 1973). One's total belief system consists not only of values (a relatively small number of prescriptive-proscriptive beliefs about desirable end-states and desirable modes of behavior), but also of value-derived beliefs and attitudes (Rokeach 1968a,b; 1980) toward countless thousands of objects and situations. Such a total belief system represent a person's cognitive framework (cognitive map (Tolman 1948)) guiding and regulating all kinds of mental activities and behavior.

We thus arrive at a view of a human personality not as an organization of traits, which is inherently much too rigid or resistant to change, but as an organization of beliefs, attitudes, and values, a belief system organization capable of maintaining its stability over time, yet also capable of undergoing continual change as social circumstances, motivations and changes in life cycles require, but always with a main eye directed toward the maintenance and enhancement of self-esteem. The more central are the components maintaining their stability or undergoing change (values), the greater will be the likelihood of stability or change in related beliefs and attitudes within the belief system organization, and in the behaviors regulated or controlled by the belief system.

How can people's belief systems, and behaviors regulated by such belief systems, best be affected by other people? Humans continually assess whatever they do or say in their everyday lives for its implications about their own sense of competence and morality. Such assessments may be correct or incorrect, and more often incorrect than correct (Nisbett and Ross 1980). But any information, that a significant other (a teacher, an experimenter, a therapist) might provide to a person, that is perceived to have implications for oneself as a competent or moral person will become especially salient or important to the person. Depending on the nature of the information provided, the person will experience varying degrees of feelings of satisfaction or dissatisfaction with himself or herself. A change in belief systems and behavior is expected to come about to the extent that the information provided to the person (about what one believes, values, or does) leads him or her to become dissatisfied with self. Self-dissatisfaction is a noxious state and should set into motion a sequence of cognitive reorganization and behavioral changes that should lead to the alleviation or reduction of such feelings of self-dissatisfaction. Conversely, stability, or the constancy of belief systems and behavior, can result when the salient information provided to a person about one's competence or morality leads him or her to feel gratified.

Humans are for the most part unaware about the structure, the content and the functions served by their belief systems because belief systems are distinctively "silent organizations" (Scheerer 1954). They are especially unaware about their values, how their values are arranged into hierarchies, how they determine value-related attitudes and behavior, and how their values, attitudes, and behavior help to maintain and enhance their conceptions and presentations of themselves. But humans typically have a natural curiosity to know more about themselves, to know more about their own belief systems, and to know how their belief systems affect their everyday behavior. They also have a curiosity about the belief systems and behavior of significant others, if only to allow for comparison with others (Festinger 1954).

We, therefore, propose to influence (either to stabilize or to change) belief systems and behavior by providing a person with important information about self--with information about one's behavior and its relation to the structure, content, and functioning of one's belief system of which he or she is typically unaware. More specifically , we focus upon information provided a person about one's central values, and how such values are specifically related to one's attitudes and behavior that are believed to be especially important to the person, and thus to be especially likely to arouse feelings of satisfaction or dissatisfaction about oneself. Selective experimental feedback of such salient information about oneself should lead some people to discover that they hold certain values or engage in certain behaviors that are incompatible with self-conceptions or self-presentations. This information should lead others to discover that their values and behavior are compatible, that is, it should lead them to confirm what they had hoped or thought was true about themselves. Such selective feedback should lead to feelings varying in degree of self-dissatisfaction or self-satisfaction which, in turn, should lead either to changes or to the stabilization of cognitions and related behavior. Either way, unidirectional self-maintaining or self-enhancing processes (of stability or change) should be initiated by such selective feedback of information about one's self.

There is, however, a danger that must be avoided when providing such information. Since information presented under conditions of self-presentation (to others) is more likely to arouse ego-defense, we advocate the method of self-confrontation rather than confrontation by significant others when presenting such information. Important information about self provided under conditions of privacy, we assume, should be less ego-threatening, more likely to be faced up to in a rational rather than rationalizing manner, and thus more likely to have longer-lasting stabilizing or destabilizing effects on values, attitudes and behavior. Those experiencing self-dissatisfaction under conditions of self-confrontation are expected to take steps to reduce or eliminate such feelings--by reorganizing their values, attitudes, and behavior, in directions designed to maintain, and better yet, to enhance their self-conceptions. In contrast, those experiencing satisfaction following the induction of salient information about self should attempt to perpetuate and extend such feelings. Thus, it may be conjectured, a person should maintain the stability of one's values, attitudes and behaviors insofar as he or she will feel satisfied with the information provided about oneself, and should change insofar as he or she experiences dissatisfaction following feedback of such information.

REVIEW OF THE LITERATURE

It should perhaps be reiterated here that the theoretical rationale discussed in the preceding pages is a general rationale for influencing belief systems, values, attitudes and behavior, and that it is not a rationale that is distinctively directed toward influencing drug abuse behavior. I now turn my attention more specifically to address the question of what is known about the values of drug abusers and non-abusers.

First to be reviewed are data suggesting that the values of drug abusers are different from those of non-drug abusers. Second, I will summarize the available experimental evidence suggesting that undesirable values can undergo change and that various kinds of value-related attitude and behavior changes will follow from such value change.

Toler (1975) has provided us with data that document dramatically the sharp value differences that exist between addicts and non-addicts, more specifically, between alcoholics and heroin addicts between the ages of 20 and 50 and a comparable non-addict sample drawn from a national sample. Toler employed the Rokeach Value Survey (1967) to first compare 42 male alcoholics with 43 male heroin addicts in a V.A. Hospital in Vancouver, Washington. Virtually all of these were Vietnam-era veterans who had been admitted to the Drug Treatment Unit. Respondents first ranked 18 terminal values in order of their importance in their daily lives, and they then ranked 18 instrumental values in order of importance. Each set of 18 values was printed on separate gummed labels, which were movable and removable, and were presented alphabetically down the right-hand side of the page. Respondents rearranged these 18 values into 18 boxes printed down the left-hand side of the page, in order of importance. Toler then compared the ranked values of these two groups of addicts with a roughly comparable sample of 544 males between the ages of 20 and 50 drawn from a national sample tested in the spring of 1971 by the National Opinion Research Center at the University of Chicago (Rokeach 1974). I say "roughly comparable" because the male addicts and national sample of males were not further matched on such demographic variables as education, income, religion, or the like. Nonetheless, Toler's results are sufficiently impressive to deserve being reproduced here in Table 1.

The reader's attention is drawn specifically to the following findings concerning the values of alcoholics and heroin addicts:

1. The values of alcoholics and heroin addicts are virtually indistinguishable from one another. The rank order correlation (rho) between the composite rankings of these two groups of addicts is .97 for the 18 terminal values, and it is .81 for the 18 instrumental values. Considering each of the 36 values separately, very few of the differences are statistically significant, and those few that are significant could easily have arisen by chance.

2. By combining the two groups of drug abusers and comparing this combined group's values with those of the comparable national sample, it is evident that drug abuser values differ substantially from those of non-drug abusers. But this difference is found only with respect to terminal values, and not with respect to instrumental values. The rank order correlation between the composite value rankings of the two samples is only .43 for the terminal values, but is .93 for the instrumental values. These findings suggest that alcoholics and heroin addicts can be distinguished from their non-addict counterparts relatively easily by the priority they place on the end-values they consider important, but not by the priority they place on means-values.

3. When we inspect table 1 further, in order to ascertain which particular terminal values distinguish between drug abusers and non-drug abusers, we note that 14 of the 18 terminal values discriminate between them at statistically significant levels. Moreover, we note, drug abusers care significantly more than do non-drug abusers for *personal* values (*an exciting life*, *a sense of accomplishment*, *happiness*, *inner harmony*, *mature love*, *pleasure*, *self-respect*, and *wisdom*) and they care significantly less for *social* values (*a world at peace*, *equality*, *family security*, *freedom*, *national security*). The only exception is found for the religious value *salvation*, which I would judge to be a personal value, and which the drug abuser sample ranks as being significantly less important than does the comparable national sample.

These findings suggest that the Value Survey can be employed as a diagnostic tool to identify drug abusers. In line with common sense, the findings suggest that drug abusers are typically more preoccupied with the realization of personal end-values and are generally less interested in the realization of social end-values.[1] Questions thus arise as to whether there is any evidence to suggest that it might be possible to reverse or alter the priority of personal and social values, and whether there is any evidence to suggest that attitudes and behaviors related to personal and social values might thus also be affected.

Before turning to an examination of the available experimental evidence, however, let me review briefly what is known about the values of persons differing in their use of another, milder substance--tobacco. Although the available data are not nearly as compelling as Toler's data on the values of hard drug users, they are nonetheless informative, because they come, first, from a variety of samples and because, second, they provide us with a reasonably similar pattern of results. Data are now available from a representative sample of adults aged 19 years or over, in the state of Washington, comparing the values of smokers (defined as those who reported that they now smoke cigarettes) and nonsmokers (those who reported they never smoked cigarettes), and additional data, comparing the values of smokers and nonsmokers, which comes from a national sample in Hungary.[2] A third study was carried out by Conroy (1975, 1979) comparing the values of four

TABLE 1

Median Group Rankings of Terminal and Instrumental Values and Composite Rank Orders for Alcoholics, Addicts, Combined Alcoholics and Addicts, and the General Population+

	Alcoholics (N = 42)	Addicts (N = 43)	Combined Groups (N = 85)	Population (N = 455)
Terminal Values				
A comfortable life	9.00 (10)	12.00 (12)	10.40 (10)	9.72 (11)
An exciting life	11.50 (11)	10.00 (10)	11.11 (11)	14.34 (16)***
A sense of accomplishment	7.00 (6)	7.67 (8)	7.25 (7)	9.22 (8)*
A world at peace	12.50 (14)	13.08 (15)	12.94 (14)	3.22 (1)***
A world of beauty	13.50 (16)	12.92 (14)	13.21 (15)	12.85 (15)
Equality	11.00 (12)	11.63 (11)	11.75 (12)	7.94 (5)***
Family security	4.50 (3)	6.75 (5)	5.75 (5)	3.99 (2)**
Freedom	8.83 (9)	7.63 (7)	8.19 (9)	4.82 (3)***
Happiness	4.50 (2)	5.42 (3)	5.29 (3)	7.59 (4)**
Inner harmony	5.50 (5)	5.43 (4)	5.44 (4)	10.97 (13)***
Mature love	7.25 (7)	6.88 (6)	7.06 (6)	10.59 (12)***
National security	15.41 (18)	16.82 (18)	16.45 (18)	9.65 (10)***
Pleasure	12.50 (13)	12.75 (13)	12.67 (13)	14.53 (17)*
Salvation	14.83 (17)	15.00 (17)	14.88 (17)	11.06 (14)**
Self-respect	4.06 (1)	4.75 (1)	4.31 (1)	8.02 (6)***
Social recognition	12.90 (15)	14.88 (16)	13.57 (16)	14.91 (18)
True friendship	8.33 (8)	8.00 (9)	8.18 (8)	9.38 (9)
Wisdom	5.00 (4)	5.20 (2)	5.11 (2)	8.55 (7)***

Instrumental Values				
Ambitious	5.50 (3)	8.01 (8)	6.38 (5)	5.45 (2)
Broadminded	5.00 (2)	7.00 (4)	6.00 (2)	7.40 (4)
Capable	7.83 (7)	7.80 (6)	7.81 (6)	8.71 (6)
Cheerful	10.33 (10)	12.14 (14)	11.55 (13)	11.60 (14)
Clean	10.93 (12)	10.25 (10)	10.78 (11)	10.92 (12)
Courageous	9.83 (9)	8.00 (7)	9.22 (8)	8.41 (5)
Forgiving	7.50 (6)	10.33 (11)	9.57 (10)	9.08 (8)
Helpful	10.90 (11)	11.60 (13)	11.14 (12)	9.48 (10)*
Honest	4.00 (1)	4.24 (1)	4.25 (1)	3.38 (1)
Imaginative	15.75 (18)	14.13 (18)	14.86 (18)	13.78 (18)
Independent	11.50 (14)	7.67 (5)*	9.40 (9)	9.08 (9)
Intellectual	13.00 (17)	13.57 (16)	13.20 (16)	11.67 (15)
Logical	11.00 (13)	12.25 (15)	11.60 (14)	12.11 (16)
Loving	8.00 (8)	8.67 (9)	8.63 (7)	10.22 (11)
Obedient	13.00 (16)	14.13 (17)	13.60 (17)	13.72 (17)
Polite	12.67 (15)	11.25 (12)	11.92 (15)	11.54 (13)
Responsible	7.00 (4)	5.44 (2)	6.13 (3)	5.80 (3)
Self-controlled	7.17 (5)	5.60 (3)	6.14 (4)	8.74 (7)

+Figures shown are median rankings and, in parentheses, composite rank orders.
*p < .05; **p < .01; ***p < .001

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groups, of 100 each, of university employees at the State University of New York at Buffalo: Smokers (four cigarettes per day for a minimum of two years and expressing no desiro to quit), Nonsmokers (complete abstainers), Unables (20 cigarettes per day for a minimum of five years, expressing the desire but unable to quit), Exsmokers (20 cigarettes per day for a minimum of five years but have not smoked for at least 18 months previously).

Consider first the more or less *uniform* value differences found for adult smokers and non-smokers in the state of Washington, in New York, and in Hungary. By *uniform* I mean value differences that are consistently in the same direction, wherein at least one of the value rank differences reaches statistical significance for the smokers and nonsmokers in Washington, or New York, or for each of three age groups (20-39, 40-59, 60 and over) in the national Hungarian sample: all told, a comparison among five groups of smokers and nonsmokers. All five groups were tested with the Rokeach Value Survey (translated into Hungarian, of course, for Hungarian respondents). The results uniformly show that all five groups of smokers, compared with nonsmokers, generally care more for (rank higher) *a comfortable life*, *an exciting life*, and *pleasure*--hedonic terminal values--and care more for being *broadminded* and *capable*--instrumental values concerning competence. In contrast, nonsmokers uniformly care more for the terminal value *salvation*, and for the instrumental value, being *loving*. Both of these could be considered religious values.

Conroy's additional data concerning his "unable to quit" and "ex-smoker" groups add to this general picture, yet extend it in a direction that allows us to speculate further on the specific values that seem to be implicated in the ability or inability to quit smoking. Summarizing these findings, it would seem that the main differences between Exsmokers and Unables are that the former place a higher value on *a sense of accomplishment*, on *social recognition* (terminal values), and on being *independent*, *intellectual*, and *self-controlled* (instrumental values). In contrast, Unables value *salvation* and *true friendship* (terminal values) more, and being *forgiving* and *loving* (instrumental values) more.

It is perhaps worth emphasizing that the uniform value profiles of Smokers and Nonsmokers, and of Unables and Exsmokers were obtained with value measures that, while reasonably reliable, were not as reliable (Rokeach 1973) as they could have been. Each value was measured by a one-item word, or at most a one-item phrase (with a brief defining phrase added in parentheses). Taking this into account, the uniformity of results obtained in the U.S. and Hungary strongly suggests the presence of systematic value differences associated with smoking and nonsmoking, having their origin in, or at least pointing to, individual differences in hedonistic, religious, competence, and possibly affiliative values and needs. But these findings are at best merely suggestive. We need more research, with more reliable value measures, and more research to ascertain the effects of various possibly confounding variables, such as sex, age, strength of religious commitment, social class, and education.

Nonetheless, we seem to be on safe ground to conclude from the data presently available, and especially from Toler's data on alcohol and heroin addicts, that there are pervasive value differences between non-drug and drug users (and abusers). I will return later on in this chapter to consider whether values are antecedents or consequents of drug abuse.

Having established that value differences exist between persons differing in drug use, I turn now to discuss a second major question that would be central in a value approach to the reduction and prevention of drug abuse: What do we know about the possibility of influencing values (either by changing them or by stabilizing them) and thus influencing value-related attitudes and behaviors? Recall my earlier suggestion that the most crucial initiators of change are "deep structure" values that are discovered (by the method of self-confrontation) to be discrepant with self-cognitions. A person must do something about such discrepancies because they threaten self-maintenance and self-enhancement. Awareness of such discrepancies implicating self-cognitions leads to focused feelings of dissatisfaction with self. Such feelings of self-dissatisfaction are conjectured to be the major mechanism that initiates a process of long-term cognitive and behavioral change.

Conversely, values (and related attitudes and behavior) that are perceived by a person to be wholly compatible with self-cognitions about one's competence or morality should endure because they arouse feelings of self-satisfaction; they are rewarding, ego-gratifying, and thus self-perpetuating.

A fairly substantial body of experimental and quasi-experimental evidence is now available that bears upon the validity of a belief system, value-based, self-confrontational approach to stability and change in cognitions and behavior. Since most of this evidence has been reviewed earlier (Rokeach 1979a, 1980) and has been updated even more recently (Ball-Rokeach et al. in press), I will content myself here only to summarize rather than to review the available evidence. But before I do so, I should like to draw attention to the following:

1. For the most part, the available evidence is specifically directed to the problem of reducing various kinds of socially undesirable values, attitudes and behaviors but is not specifically addressed to the problem of drug abuse, with certain exceptions to be mentioned below.

2. I will supplement this summary of the literature by drawing attention to other research by ourselves and others in which we have moved beyond the laboratory and classroom to employ the television medium to influence change and stability in belief systems and behavior. There are two main reasons why we have

moved to television. First, far greater numbers of people can be reached, and second, television is an ideal medium for providing people with information about themselves via the method of self-confrontation.

3. I will also attempt to draw attention to other research now in progress that I believe will be relevant to drug abuse researchers.

We have thus far identified 24 experimental studies, carried out by our own research group and by others, in which a value-based, self-confrontational approach had been employed to influence long-term stability and change in cognitions and behavior.

> The basic paradigm is the same for all such studies. Via the method of self-confrontation, experimental subjects are given feedback designed to increase self-awareness about their own and others' values, and how their own and others' values are related to specified attitudes and behaviors. In this way, many experimental subjects discover discrepancies or contradictions implicating their self-conceptions. The psychological mechanism that is aroused in such subjects is a specific state of self-dissatisfaction that they can identify for themselves. (Rokeach 1980, p. 297)

In nine of these 24 experimental studies, respondents indicated, immediately following the experimental feedback of objective information about own and others' values, attitudes, and behavior, whether they were "satisfied" or "dissatisfied" with the value rankings they had given prior to the treatment. Without exception, all nine studies showed larger, statistically significant value changes, measured weeks and months subsequent to treatment, among those who were "dissatisfied" than among those "satisfied" with their rankings given to target values.[3] Yet, while such findings provide us with convincing evidence about the central role played by the arousal of feelings of self-dissatisfaction, we do not as yet know whether such feelings are alleviated following cognitive or behavioral change. This specific question deserves to be followed up in further research, and we are doing so in a NIDA-supported project presently underway on reducing and preventing smoking in adolescents.

Of the 24 studies employing the present paradigm, value changes were measured, usually weeks or months afterward, in 22 of them. In 95 percent of these (21 out of 22) the researchers reported statistically significant changes in one or more of the theoretically expected values. Value-related attitude changes were measured in 10 of these studies, and 70 percent of these studies (7 out of 10) showed statistically significant attitude changes. Value-related behavioral changes were measured in 14 of these experiments; 50 percent of these studies (7 out of 14)[4] showed statistically significant long-term behavioral changes.

Moreover, these changes were obtained many weeks or months after the treatment, and in one experiment, as long as 21 months afterward (Rokeach 1973).

Thus, the available experimental findings suggest that investigators using our research paradigm:

> ....have succeeded in bringing about socially desirable long-term changes in important values and in related attitudes and behavior with respect to such diverse issues as racism, ecology, smoking, and teacher performance, and that such changes can be brought about by a single experimental session. Messages in such a session may be communicated by a human experimenter, an interactive computer, the printed word, and closed-circuit television. Variations in the prestigefulness of source, channel of communication, or personality of the receiver (except possibly for locus of control), do not seem to make much difference since long-term effects are reported regardless of such differences (Ball-Rokeach et al. in press, p. 4-24 and 4-25).

The above summary of the experimental literature would, however, be incomplete if I did not also draw attention to several other major studies which have either been completed recently or which are presently underway. I believe that our most impressive findings to date come from a research project (Ball-Rokeach et al. in press) in which we employed our value approach to produce a thirty-minute television program entitled "The Great American Values Test." This television program was subsequently viewed, voluntarily, by large numbers of adults in the Tri-Cities area of eastern Washington, in the privacy of their homes. The television program, co-hosted by Mr. Edward Asner (of the Lou Grant show) and Ms. Sandy Hill (ex-anchor woman of ABC's Good Morning America show), was shown simultaneously on all three commercial networks (NBC, CBS, ABC) as a public service program. After a fifteen-minute general introduction about what are human values, how values are measured, and value similarities and differences among Americans differing in race, sex, age, etc., the program focused upon three values in particular: freedom, equality, and a world of beauty, and "needled" viewers to increase their regard for these three values by drawing attention to various contradictions that had previously been found to exist in many Americans between their espousal of such values and their attitudes or behaviors concerning racism, sexism, and ecology. For instance, Mr. Asner says:

> Americans feel that freedom is very important. They rank it third. But they also feel that equality is considerably less important....they rank it twelfth. Since most Americans value freedom far higher than they value equality, the question is: What does that mean? Does it suggest that Americans as a

> *whole are much more interested in their own freedom than they are in freedom for other people*? Is there a contradiction in the American people between their love of *freedom* and their lesser love for *equality*?
>
> By comparing your values with these results, you should be able to decide for yourself whether you agree with the average American's feelings about *freedom* and *equality*.

Since we did not contact the viewers of the program in advance, or invite their participation, we had to overcome a number of challenging methodological problems in order to ascertain whether our television program had any demonstrable effects: Did the respondents actually watch the program in the privacy of their homes? Did they watch the program without interruption? How did we know what their values were prior to watching? How could we find out whether their values and related attitudes underwent change as a result of viewing our program? And most important of all, did their behavior undergo change, and how did we find out whether it did or didn't?

While the full details of this television project will be presented in our forthcoming monograph (Ball-Rokeach et al. in press), it is possible to summarize here the findings obtained: Uninterrupted viewers of the television program, when compared with interrupted viewers and with non-viewers, had (1) uniformly increased their rankings of the three target values, *freedom*, *equality*, and *a world of beauty*, and (2) become less racist, less sexist and more pro-environment in their attitudes. (3) Most important of all, uninterrupted viewers responded more favorably than did the other groups to mailed solicitations from three existing organizations in the state of Washington specifically dedicated to the advancement of anti-racist, anti-sexist and pro-environmental causes. Table 2 shows the effects of our television program on the amount of money collected in response to three solicitations received through the mail by all respondents--two to three months after the television program had aired. Shown in table 2 are the average amounts of money donated to all three solicitations combined, and to each of them considered separately from uninterrupted viewers, interrupted viewers, and two groups of non-viewers.

Like most of the two dozen studies using the belief system-value-self-confrontation paradigm, "The Great American Values Test" focuses upon the question of influencing stability and change in values, attitudes, and behaviors other than those implicated in drug abuse. But three experimental studies in particular do focus upon drug abuse, more specifically, tobacco abuse. Two of these have been carried out by Conroy (1975) and DeSeve (1975); Conroy has provided us with a detailed summary of both of these two researches (1979). Both of these studies were carried out with adult smokers who, strongly motivated to quit smoking, had volunteered to undergo treatment at anti-smoking clinics in New

TABLE 2

Mean Amounts Contributed by Uninterrupted Viewers, Compared With Interrupted Viewers and Nonviewers in Experimental and Control City

	N	Environment	Anti-Racism	Anti-Sexism	All 3 Combined
Uninterrupted Viewers	178	29.2¢	14.1¢	25.8¢	69.1¢
Interrupted Viewers	157	7.6¢	.0¢	.0¢	7.6¢
Nonviewers, Experimental City	953	4.9¢	6.3¢	5.5¢	16.7¢
Nonviewers, Control City	699	5.3¢	6.4¢	.3¢	12.0¢

Reproduced from Ball-Rokeach, Rokeach, and Grube, in press, with permission of the authors.

York and Washington. Both focused upon the target value self-control, and provided feedback drawing attention to discrepancies between smoking, wanting not to smoke, and the low priority the adult smokers placed on self-control as a value. Both sets of findings show that value for self-control had increased in importance in the weeks following the treatment: moreover, decrements in smoking in experimental groups undergoing the value-based, self-confrontation treatment were significantly greater than those manifested by control groups receiving traditional fear-arousing appeals.

Nonetheless, the effects reported by Conroy and DeSeve dissipate over time, as they typically do in more traditional treatments. Thus, the challenge posed by such findings is to find additional ways to extend the long-term persistence of such effects. Put another way, the theoretical challenge posed by various approaches researchers might employ to achieve the reduction of drug abuse is to shift from demonstrations of statistical significance of cognitive and behavior change immediately following one or another treatment (which is relatively easy to demonstrate and which is more likely to be accepted for publication in refereed journals), and to find ways to extend the duration or persistence of such effects. I am generally unimpressed with reports of statistically significant differences between experimental and control groups obtained immediately following treatment (whether or not it concerns value, attitude, or behavior change), because such findings are extraordinarily vulnerable to alternative interpretations (Freese and Rokeach 1979).

The third smoking study is one we are presently carrying out with NIDA support. It enabled us to produce a second television program entitled "Smoking, Human Values, and You" (co-hosted by Sarah Purcell and John Barbour of Real People) focusing upon attempts to influence certain values that previous research (summarized above) had shown to differentiate between nonsmokers, smokers, and exsmokers. Its major objective is not only to reduce and prevent smoking by changing the values underlying smoking or by stabilizing the values underlying not smoking (a psychological approach), but also to bolster, maintain and extend such psychological influences through supplementary "sociological" social control variables (Gibbs 1982), so that the values and behavioral effects would persist longer. More specifically, we are attempting to increase the persistence of the psychological effects produced by our television program via the social "pulls" implied by social support (Newcomb et al. 1967) on the one hand, and the social "pushes" implied by social pressure on the other. We conceive of social support as a social control mechanism that attempts to maintain or reinforce socially desirable cognitions and behavior at existing levels via reward or positive reinforcement. We conceive of social pressure as another social control mechanism that attempts to change socially undesirable cognitions and behavior via social sanctions. For example, a "No Smoking" sign in a restaurant is an attempt to exert social pressure to discourage smoking; inviting guests who all smoke (or who all do not smoke) to a dinner party is an example of an attempt to provide social support; and inviting only one guest who smokes is a witting or unwitting attempt to exert social pressure.

Summarizing, our present research attempts to extend the persistence of influence effects (Cook & Flay 1978) by combining the arousal of psychological processes (the arousal of feelings of self-satisfaction or self-dissatisfaction) that might encourage cessation and prevention of smoking with environmental supports on the one hand and environmental pressures on the other. I believe that such a combination of psychological and sociological modalitites will turn out to be a more effective general approach to bringing about long-term, socially desirable cognitions and behavior, and the discouragement of long-term socially undesirable cognitions and behavior.

Our present research is, however, still in progress and our data are still in the process of being analyzed. We are unable, at this time, to provide any additional information about the results of our multi-pronged psychological and sociological approach.

I would like to round out this general review of value-based research by mentioning one other health-related project. It concerns an attempt to encourage the use of auto safety belts, and it is being carried out by Pam Fortin and Michelle Bell of Dayspring Associates, a Seattle-based research group. Supported by The Washington Traffic Safety Commission, this research group has produced a 12-minute film which, using the self-confrontation method, focuses upon the terminal value family security, which most people normally rank very high; it also focuses upon the contradiction existing within many people between their high value for family security and their failure (and their children's failure) to use seat belts. The Seattle Times, (March 6, 1983) reports that there are "increases in seat belt use up to 40 percent among 3,000 employees in 14 firms." While I have not seen the final report, I understand (personal communication) that it will soon be available from The Washington Traffic Safety Commission in Olympia, Washington.

SUGGESTIONS FOR FUTURE RESEARCH

I would now like to offer several suggestions about future lines of research that might be fruitful. Nothwithstanding my contention, expressed at the beginning of this chapter, that our research paradigm can in principle be applied with equal ease both to the modification and to the prophylactic prevention of undesirable behaviors, it is obvious that attempts to modify drug behavior present additional obstacles, because there is the added burden of addiction that must be overcome. Such an added burden seems to be distinctive to the issue of drug abuse. It is not a problem, when we think of modifying many other socially undesirable behaviors, such as racist or sexist behavior, pollution of the environment, or when we think of modifying the behavior of teachers so that they might become better teachers, or the behavior of drivers so that they might use seat belts.

But if instead we focus upon the prevention of drug abuse, we can proceed more straightforwardly to ask how the knowledge acquired from a value-based approach might contribute to prevention. One suggestion, stimulated especially by Toler's findings (Table 1), may seem unconventional to specialists in the field of drug abuse who are committed to the advocacy of more and better drug education directed to adolescents. While I see nothing wrong with such an approach, Toler's findings suggest that it can be accompanied by, or supplemented with, a more generic value education approach. Not only the school, but also parents and religious institutions, can all participate in a consciousness-raising value education program that invites adolescents to examine their own values and compare them with those that are characteristic of other groups and subgroups. Such a program would, one, draw attention to the fact that humans differ in the priorities they place on personal and social values; two, draw attention to the fact that drug abusers typically place higher priorities on personal values at the expense of social values; and three, point out that such a drug abuser value pattern can at best only maintain, but not enhance, self-esteem. It is reasonable to suggest that a generic value education program that unabashedly stresses the greater importance of social over personal values will, first, lead to long-term increases in the importance that adolescents will place on social values, and to concomitant decreases in personal values. Second, it should culminate in related behavioral changes that will be manifestations of the greater priority placed on social values. Such behavioral manifestations are anticipated to include a generally greater likelihood to engage in all sorts of pro-social behavior and a generally lesser likelihood to engage in anti-social behavior, which would include, but would not be restricted to, a lesser likelihood of drug abuse.

While the value differences between cigarette smokers, nonsmokers, and exsmokers are not nearly as marked as those between hard drug users and non-users, we must, nonetheless, pay attention to the cross-cultural uniformity of findings regarding value differences among them. Such findings further suggest a value education program that focuses upon discouraging hedonic values, upon fostering competence values and the value of self-discipline, and upon fostering religious values, as generic ways to prevent smoking.

A second question that, I believe, merits further research is whether values are antecedents or consequences of drug abuse. Not all people who drink alcohol become alcoholics, and not all people who shoot heroin become heroin addicts. This would suggest that people differ in such predispositions and it can thus be conjectured that value priorities, however arrived at, may predispose one to employ or not employ drugs, or to employ drugs abusively or non-abusively.

Yet, there are reasonable grounds also to conjecture that drug abuse will lead to changes in value priorities, to an increasing preoccupation with the gratification of personal values, and to an increasing indifference about social values. More research is thus needed to inform us about the conditions under which values are the antecedents and consequents of drug abuse.

A third line of research is the extent to which the priority given to health[5] over other values is a determinant of drug abuse. Are adolescents more prone than older persons to abuse drugs because they care less than older persons about health as a value? Is this because they see themselves as more indestructible or invulnerable and thus less motivated than older groups to avoid drug abuse? If so, research directed toward a better understanding of the relative importance of health as a value among persons of varying age might be informative, as would be a better understanding of the role played by perceived indestructability, or perceived invulnerability as mediating variables.

A fourth line of research derives from our successful use of at least one television program to influence target values, attitudes, and behavior. It is time now, I believe, to move away from expensively produced television programs (say, 30 minutes long) to explore the effects of more economical "spot announcements." What could we say, for instance, within a 30-second Public Service, value-based announcement that could possibly make a difference, that could possibly have a demonstrable effect on preventing drug abuse among adolescents?

CONCLUSION

Given the enormous problems posed by drug addiction, it seems obvious that there should be a generally greater payoff from research efforts aimed at prevention rather than the elimination of drug abuse. I am therefore altogether comfortable with the decision of the organizers of this NIDA conference to invite contributions focusing on prevention.

I believe that the experimental evidence reviewed in this chapter overwhelmingly demonstrates the validity of our social-psychological belief system-value-self-confrontation approach to influencing stability and change in important values, attitudes, and behaviors. But now, the question that challenges us most is what leads to the long-term persistence of stable or changed values, attitudes, and behavior? This is an issue that requires us to call upon the analytic and theoretical skills of sociologists as well as psychologists. As I have already indicated, I believe that the basic sociological variable that maintains or freezes stable or changed values, attitudes, and behaviors, which can be initiated by the psychological arousal of feelings of self-satisfaction or self-dissatisfaction, is social control, which either takes the form of social support or social pressure. Here the evidence is far from complete and I hope that future research will focus attention in more detail upon how our values, attitudes, and behaviors, once initiated by psychological forces, are then perpetuated or controlled by sociological forces.

FOOTNOTES

[1] After having studied the value patterns of literally hundreds of adult groups over the past decade and a half, it appears to me that the personal-social "value split" that Toler reports is most unusual, yet understandable.

[2] The research group was headed by Dr. Elemir Hankiss of the Hungarian Academy of Science. I am extremely grateful to him for making these data available to me. They are, of course, summarized here with his permission.

[3] For additional evidence bearing on the effects of self-dissatisfaction obtained by others using other theoretical approaches see Ball-Rokeach et al. in press.

[4] While these "batting averages" are impressive, readers may nonetheless wonder why the percentage of significant effects decreases from values to attitudes to behavior. I believe the reasons are mainly methodological. For instance, in one study (Sherrid and Beech 1976), wherein New York policemen were the subjects, the behavioral test was whether or not they showed up on their day off to attend a race relations lecture. Virtually no one of the experimental or control subjects did, thus leading to no significant differences.

[5] Form G of the Rokeach Value Survey, which is the most recent version (1982), includes "Health (physical and mental well-being)" as one of 18 terminal values that is to be ranked in order of importance.

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Prevention of Adolescent Substance Abuse Through Social Skill Development

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ABSTRACT

The purpose of this chapter is to evaluate the capability of social skills training approaches for preventing adolescent substance abuse and to suggest directions for future research in this area. Social skills and training are defined from the perspective of social learning theory. Training approaches are then reviewed for their effect on drug use and drug use-related behaviors. The results indicate that social skills training reduces substance use and related behaviors such as aggression, withdrawal, truancy, and stealing in adolescents. Outcome was enhanced by the inclusion of modeling in a training program and the use of normal (versus problem or disordered) adolescents. In addition, discriminant analyses indicated that the more positive outcomes were discriminable by a focus on prevention, experimental rigor, and training comprehensiveness, that is, inclusion of multiple techniques and skills. Follow-up results showed that training effects were maintained, and that they could be generalized to several areas of everyday adolescent functioning. The findings suggest that social skills training is an effective means for substance abuse prevention in adolescents, and that it may have an advantage over more direct prevention methods in terms of long-term generalization capabilities. Finally, several issues are raised for their potential impact on social skills training as a strategy for substance abuse prevention in adolescents. These issues encompass conceptual, methodological, and evaluative domains: development of a taxonomy of person-situation specificity characteristics to increase the validity and reliability of assessment and training procedures; assessment of the relative contribution of individual differences in adolescents to training outcome; identification of qualitative developmental shifts in social skills as adolescents progress through grade, school, and family transitions; and comparison of the maintenance and generalization effects, over time, of social skills training with more direct abuse prevention methods. Guidelines are offered for addressing these issues, as well as directions for the role of social skills training research in future drug abuse prevention efforts.

DEFINING SOCIAL SKILLS

Social skills, sometimes collectively referred to as social competence, are generally defined as the "ability to cope effectively with interpersonal relationships" (Argyris 1968, p. 148). A more specific definition alludes to the mutual cost-benefit aspects of social skills as the "overt and covert learned behaviors that maximize chances for obtaining positive reinforcement from social interactions while minimizing cost to self and others" (Gilchrist 1981, p. 63). The mutuality aspect distinguishes social skills from the constructs of sociability and extroversion, the latter of which represent more self-centered aspects of behavior and have been correlated positively with drug use. The notion of including both overt and covert behaviors under the aegis of social skills is explained by social learning theory (Bandura 1977; Rosenthal and Bandura 1978). According to this perspective, the concept of "social skills" is represented as a dynamic sequence of cognitions and behaviors that are reciprocally determined over time. The cognitions represent self-efficacy, i.e., "the conviction that one can successfully execute the [social skill] behavior to produce the desired outcomes" (Bandura 1977, p. 193); the behaviors represent the actual overt performance of social skills.

Social skills are differentiated from personal, extra-personal, and health problem skills in that their primary function is communication with others (Swisher 1976). Particular communicative function is typically used as a basis for classifying individual social skills, e.g., praise, disagreement, assertive expression of rights (see for example, Goldstein et al. 1979).

SOCIAL SKILLS, DRUG USE, AND ADOLESCENTS

Two seemingly disparate bodies of reasearch suggest that social skills and drug use may be negatively related in adolescence. Developmental research has indicated that adolescents are concerned with and intellectually ready for development of social skills that carry them through transitional school, family, and peer relationships and ultimately assist them in establishing responsibility in long-term relationships (Douvan and Adelson 1966; Ford 1982; Hops and Cobb 1973; Piaget and Inhelder 1969). Some of the more notable social skills required in adolescence appear to be assertiveness, expression of opinion, ability to disagree and refuse, and ability to make requests and initiate conversation (Goldstein et al. 1979; Pentz 1980a; 1982a and b; Schinke 1981). Adolescents who experience delay in learning social skills or who remain skill deficient are prone to the development of such drug-use-related problems as delinquency, truancy, aggression, and academic and social withdrawal (Goldstein et al. 1978; Quay and Quay 1965).

At the same time that the need for social skills is increasing in adolescents, a number of studies have indicated a concomitant increase in the incidence and prevalence of drug use, particularly cigarettes and alcohol (Pentz 1982a and b; Perry and Murray 1982). The onset has been related to peer pressure to use drugs, and exposure to drug-using peers, both of which imply an inability to exert social skills such as refusal (see Christiansen et al. 1982; McAlister et al. 1979). Development of drug use in adolescents has also been correlated with other problematic behavior including delinquency/aggression and social withdrawal/unassertiveness (Kellam et al. 1982; Levine and Kozak 1979; Rooney and Wright 1982). This relationship is further substantiated by retroactive, i.e., remediation-based research on adult drug abusers (e.g., Callner and Ross 1976; Chaney et al. 1978; Oei and Jackson 1982); and on pro-active, preventive-based research on young adolescents (e.g., Krosnick and Judd 1982; Pentz 1982b). The apparently negative relationship of social skills to drug use in adolescents has important implications for the field of drug abuse prevention. Interest in this relationship has led to investigation of the use of social skills training for strengthening social skills with the purpose of reducing or preventing problem behaviors such as drug use.

SOCIAL SKILLS TRAINING

Social skills are increasingly being regarded as a useful intervention target for ensuring and enhancing mental health (Masterpasqua 1981). Albee (1981) has recently proposed a prevention equation that includes social skills as a mediator to behaviors such as drug use. Others have expanded this notion to conceptualize social skills not only as a mediator to behavioral responses like drug use, but also as a means for enhancing overall day-to-day functioning (Meichenbaum et al. 1981; Wine 1981). Adolescence is becoming increasingly favored as a critical readiness period for these enhancement efforts (Hobbs and Robinson 1982).

Interest in the preventive implications of social skills has led to an upswing in cognitive/behavioral research, most particularly in the area of social skills training, the primary vehicle for promotion of social skills.

Social skills training is defined as the collective techniques used to improve the learning and mastery of social skills (Ladd and Mize 1983). The emphasis is on mutual benefit and maintenance of personal integrity in interpersonal situations (Schinke 1981). It differs from behavior therapy in its emphasis on communicative rather than specific symptom behaviors, and from psychotherapy in its greater reliance on direct therapist-initiated procedures such as instruction versus indirect techniques such as interpretation (see Trower 1978). Although there is some disagreement over the categorization of techniques (Ladd and Mize 1983), those most commonly employed include: modeling (overt or covert, live or taped, with or without instruction), rehearsal (covert or overt, with or without interactor), feedback with social reinforcement (self-or other-initiated), and extended practice (intra- or extra-training, assigned as homework or spontaneous). If used together in sequence within a single training program these techniques are referred to in social learning theory as guided participant modeling (Rosenthal and Bandura 1978). Whether or not these techniques are used, singly or in combination, the theory asserts that training should focus on the cognitive (perception of self-efficacy) as well as the behavioral (demonstration) aspects of a skill to be maximally effective.

In the field of drug abuse, there is substantial evidence to show that social skills training can reduce drug use levels, increase periods of abstinence, and prevent relapse to problem behavior such as DWI arrests (e.g., Chaney et al 1978; Foy et al. 1976; Lin et al. 1982; Oei and Jackson 1982). However, the bulk of this research has been aimed at adults who have already been labelled drug abusers. Social skills training with adolescents, on the other hand, has tended to focus only indirectly on drug abuse as it relates to problem behaviors including delinquency, aggression, and withdrawal. It is only very recently that social skills training has been applied directly to drug abuse prevention in this age group. The next section of this chapter will review adolescent social skills training research in three domains: the author's own work, social skills training that is indirectly related to drug abuse, and social skills training that is directly related to drug abuse prevention in adolescents. The latter two domains are structured to reflect changes in emphasis over the last decade.

REVIEW OF SOCIAL SKILLS TRAINING WITH ADOLESCENTS

The Author's Research

Pentz's research has followed three trends in the application of social skills training to adolescents: (1) from secondary to primary prevention; (2) from indirect to direct evaluation of drug use; and (3) from single to multiple populations. As part of her dissertation research, Pentz (1980a) developed a battery of self-report and behavioral measures for assessing adolescent assertiveness, and a multiple component group training program that included audiotaped modeling, overt rehearsal, peer feedback with social reinforcement, and extended practice "homework" in extra-training situations requiring assertive behavior with teachers, parents, and peers.[1] The investigation examined person and situation variables by comparing the effects of social skills training (three sessions with teachers, parents, or peers as trainers versus instructions versus no-training) and type of adolescent pre-training behavior (unassertive or aggressive, as identified by teacher ratings). Results indicated that: (1) three sessions of training effected significant increases in assertive behavior as measured by self-report post-test and generalization measures and by an in vivo behavioral measure of transfer; (2) teacher trainers produced more increases than parent or student trainers; and (3) students responded differently to training when grouped homogeneously by unassertive or aggressive behavior, with unassertive students performing better on self-report and worse on behavioral measures relative to aggressive students. Both pre- and post-test unassertive or aggressive responses given by students were highly congruent with teachers' ratings. The results suggest that social skills training may have a long-term cost-benefit advantage over more traditional methods of behavioral intervention which have typically required longer sessions to produce behavioral change and have been characterized by low rates of behavioral maintenance and transfer (e.g., behavior modification). Furthermore, the results suggest that person characteristics (trainer and trainee) may differentially affect outcome, and that outcome should be assessed on multiple measures in order to reduce possible biases or interactive effects associated with method variance (self-report versus behavioral).

The second study was a follow-up of the first to evaluate the congruences of students' perceptions of their trainers (Pentz 1980b). Results indicated that relative to students with parents or peers as trainers, students with teachers as trainers were more likely to perceive them as fulfilling a trainer role for social competence training.

A later investigation focused on the validity and reliability of the social skills construct in 875 sixth through ninth grade adolescents (Pentz 1981a). Four basic factors were derived. In addition, social skills correlated with standardized measures of adolescent pathology (Devereux Adolescent Behavior Rating Scales), archival measures of school truancy and absence, teacher ratings of assertiveness, and successfully discriminated unassertive and aggressive adolescents. Results suggested that social skills are a valid construct for study in adolescents, that measures of adolescent social skills are stable, and that social skills may be useful for investigations involving drug use-related behavior in adolescents (i.e., truancy, absence, aggression, and withdrawal/unassertiveness).

Three other investigations included these social skill measures in conjunction with measures of self-efficacy. Based on prior research results, adolescents were again selected on the basis of unassertive or aggressive behavior displayed with teachers (n=61 ninth grade students), and teachers were used as trainers. Rehearsal and feedback components were added (Pentz and Kazdin 1982a; Pentz and Kazdin 1982b, respectively). This step-wise strategy was used to evaluate the costs and benefits associated with length of training and simplicity of training content. Social skills training conditions were compared to no-modeling discussion groups and varied by type of situational stimulus (single type involving interpersonal situations with teachers alone versus multiple types involving situations with teachers, parents, and peers). After three sessions of modeling, results indicated that overt modeling was superior to both covert modeling and no-modeling groups, and that the repeated use of a single type of stimulus (teacher situations) proved more effective on measures involving school-related social skills. Ater two sessions of rehearsal and feedback were added, training effects transferred to spontaneous role-play and to behavior in unobtrusively observed real-life situations; however, initial modeling and situational stimulus effects disappeared.

The third study in this group of investigations assessed the contribution of individual subject differences to outcome in the modeling phase of the previous stepwise investigation (Pentz 1981b). The purpose was to assess the relative strength of modeling. Results indicated that individual adolescent differences, particularly in pre-training behavior and anxiety, accounted for more variance in self-efficacy and behavior than modeling or stimulus variables. The findings from all three studies in this group suggest that even a powerful technique such as modeling may be highly subject to fine-grained person and situation characteristics when it is used singly rather than in combination with other social skills training techniques.

Most recently, Pentz (1982a and b) has extended the use of social skills training to whole classrooms of sixth through ninth grade students on a primary prevention basis. A one-year pilot investigation confirmed the validity and reliability of self-efficacy and social measures and the positive effects of social skills training on self-efficacy, social skills, and cigarette and alcohol use. The purpose of the subsequent two-year longitudinal project was to evaluate the causal modeling relationship of social skills and self-efficacy to cigarette and alcohol use and to evaluate the effects of social skills training conducted by teachers on immediate and long-term outcome. A cohort-sequential design has been implemented to study the effects of adolescent pre-training behavior (unassertive versus assertive versus aggressive as rated by teachers) and training (social skills versus instructions versus no-training) on subsequent self-efficacy, social skills, drug use, and drug use-related attitudes. The design will allow for cross-sectional longitudinal, and cross-cohort comparisons from sixth through 10th grade. The investigation is currently in its second year and involves a total of 1472 adolescents in eight suburban and rural schools.

Several findings have emerged thus far. Based on cigarette and alcohol use levels, the sample appears to be representative of other adolescents in the Southeastern United States (Table 1; cf. Johnston et al. 1980). A four-factor structure of social skills has been confirmed (Table 2), and initial structural equation modeling suggests a causal relationship of social skills and self-efficacy to drug use (Figure 1). Multiple test-retest correlational analyses suggest that, relative to attitudinal and drug use variables, social skills may provide the most responsive target for intervention (Table 3). Regression analyses on seventh and eighth grade subsamples indicated that social skills make differential contributions to initial drug use and intention to use drugs depending on the rural or suburban system from which adolescents are sampled (Table 4). However, additional multivariate analyses have shown that type of system does not affect training outcome. These results suggest that training trends may be generalizable across demographic systems, but that achievement of prescriptive training, i.e., training that maximizes specific outcomes for specific populations, may depend on the relative emphasis placed on certain variables (e.g., more emphasis on teacher-student and parent-child relationships for rural adolescents).

TABLE 1

Respondent's Drug Use in the Last Month Classified by Substance, Grade, and Sex

	Percent of MALES (N=301)*				Percent of FEMALES (N=321)*		
Substance Grade	None	Once Month-Twice Week	2 or More Times Week		None	Once Month-Twice Week	2 or More Times Week
Cigarettes				Cigarettes			
x Gr. 6	99.0	1.0	0.0	6	97.7	2.3	0.0
7	98.5	0.0	1.5	7	100.0	0.0	0.0
8	79.4	3.2	17.5	8	88.2	10.3	1.5
9	73.5	7.4	19.1	9	77.3	16.0	6.7
Beer				Beer			
6	91.9	7.1	1.0	6	96.6	3.4	0.0
7	92.5	7.5	0.0	7	92.8	7.2	0.0
8	79.4	11.1	9.5	8	94.1	4.4	1.5
9	51.5	26.5	22.0	9	74.7	21.3	4.0
Wine				Wine			
6	86.9	13.1	0.0	6	96.6	3.4	0.0
7	87.9	12.1	0.0	7	94.0	6.0	0.0
8	73.0	17.5	9.0	8	86.8	13.2	0.0
9	69.1	19.1	11.8	9	70.7	26.6	2.7
Liquor				Liquor			
6	92.9	7.1	0.0	6	97.7	2.3	0.0
7	95.5	4.5	0.0	7	96.4	2.4	1.2
8	71.4	14.3	14.3	8	91.2	5.9	2.9
9	55.9	26.5	17.6	9	70.7	21.3	8.0

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TABLE 2

Percentage of Common Variance Accounted for by Factors (Rotated) with Eigenvalues > 1 and Item loadings $\geq .50$*

Factors	Item set:	Eigenvalues			% of Variance			Cumulative %		
		A	B	C	A	B	C	A	B	C
I.	Overall Assertive Behavior	6.48	8.53	9.20	41.0	51.0	58.2	41.0	51.5	58.2
II.	Assertive Opinion	3.37	3.49	3.45	21.3	21.0	21.8	62.3	72.5	80.1
III.	Assertive Negotiation/Sensitivity	1.91	1.50	1.19	12.1	9.1	7.5	74.4	81.6	87.6
IV.	Negative Assertion	1.33	1.33	1.12	8.4	8.0	7.1	82.8	89.6	94.7

*Item Set A generated a fifth factor with an eigenvalue > 1 and item loadings < .40.

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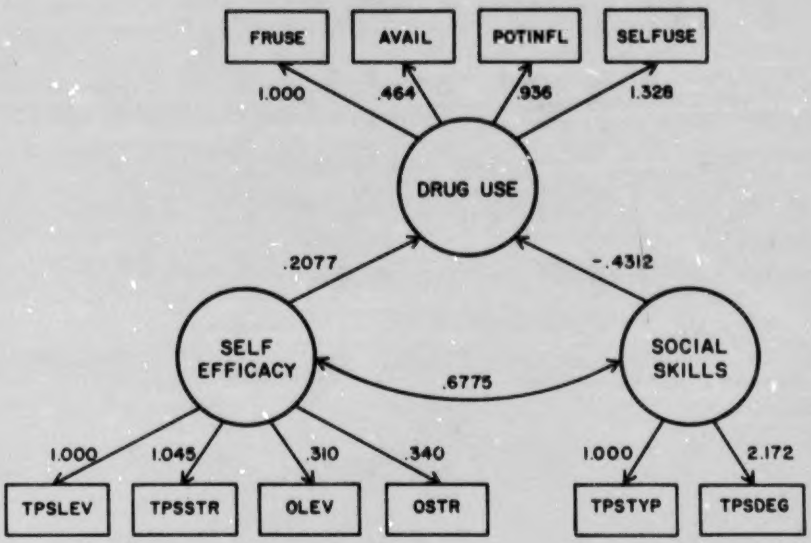
FIGURE 1

CAUSAL MODELING OF DRUG USE


FRUSE
AVAIL
POTINFL
SELFUSE
1.000
.464
.936
1.328
DRUG USE
.2077
-.4312
SELF EFFICACY
SOCIAL SKILLS
.6775
1.000
1.045
.310
.340
1.000
2.172
TPSLEV
TPSSTR
OLEV
OSTR
TPSTYP
TPSDEG

$\chi^2(29) = 42.85,\ p = .05$

Non-significance indicates an acceptable model

NOTE:
FR.USE=Friends' use of drugs
AVAIL.=Availability of drugs
POTINF=Potential influence on drug use
SELFUSE=Self-use of drugs
TPS-LEV and TPS-STR=Level and Strength of self-efficacy in teacher, parent, and student situations
O-LEV and O-STR=Level and Strength of self-efficacy in novel situations with others
TPS-TPE and TPS-DEG=Type and Degree of social skill with teachers, parents, and students

TABLE 3

Reliability Coefficients of Variable Clusters

Variable Cluster	Test/Retest Reliability (2 Weeks) Based on N=847 6-9th Grade Students	Change in 6 Months Based on Independent Sample N=231 6-9th Grade Students
Social Attitudes	.75	.71
Drug Use	.89	.67
Social Competence	.74	.36

Note: All correlations were significant at $p < .001$

TABLE 4

Actual Drug Use
(F Change Values)

Variable	Suburban				Rural				Total Drug Use
	Cig.	Beer	Wine	Liquor	Cig.	Beer	Wine	Liquor	
Demographic Characteristics	.62	2.68	3.10^{*}	2.69	4.43^{**}	4.76^{**}	2.03	1.60	6.29^{**}
Social Competence	2.97^{*}	1.74	2.45^{*}	1.10	9.09^{****}	10.76^{****}	21.74^{****}	25.25^{****}	1.06
Social Attitude	3.62^{**}	8.20^{****}	4.93^{****}	7.96^{****}	3.24^{**}	.40	1.72	2.06	6.84^{****}
Drug Use Influence	25.82^{****}	29.57^{****}	13.58^{****}	11.00^{****}	.49	.27	.34	.34	38.05^{****}
Overall F	11.10^{****}	15.90^{****}	7.95^{****}	7.79	4.65^{****}	3.72^{****}	6.97^{****}	8.20^{****}	16.13^{****}
Multiple R	.79	.84	.74	.73	.65	.61	.72	.75	.73
Total R^2	.62	.70	.54	.54	.42	.37	.52	.56	.53
Cross-sample R	$.42^{****}$	$.51^{****}$	$.46^{****}$	$.41^{****}$	$.39^{****}$	$.67^{****}$	$.50^{****}$	$.41^{****}$	--

$^{*}p < .05$
$^{**}p < .01$
$^{***}p < .001$
$^{****}p < .0001$

Note. Based on a matched sub-sample of n=281 7th and 8th grade students (147 suburban, 134 rural)

TABLE 4 (Cont'd)

Intention to Use Drugs
(F Change Values)

Variable	Suburban Cig.	Suburban Beer	Suburban Wine	Suburban Liquor	Rural Cig.	Rural Beer	Rural Wine	Rural Liquor	Total Intention
Demographic Characteristics	.70	5.61**	1.72	2.57**	.35	5.49**	.06	1.72	4.08*
Social Competence	1.45	1.50	1.07	1.02	.59	1.82	1.99	.95	3.06*
Social Attitude	5.24****	5.82****	4.75***	7.57****	2.40*	9.02****	7.09****	9.59****	16.68****
Drug Use Influence	8.03****	6.73****	4.16**	10.25****	1.63	7.22****	4.69**	4.20**	16.53****
Overall F	5.06****	5.83****	3.56****	7.23****	1.46	7.82****	4.76****	5.50****	13.98****
Multiple R	.65	.68	.59	.72	.43	.74	.65	.68	.70
Total R^2	.42	.47	.35	.52	.19	.55	.43	.46	.49
Cross-Sample R	.36****	.62****	.54****	.55****	.41****	.61****	.51****	.55****	--

*p < .05
**p < .01
***p < .001
****p < .0001

Note. Based on a matched sub-sample of n=281 7th and 8th grade students (147 suburban, 134 rural)

Perhaps even more significant are the training effects associated with grade and pre-training behavior (unassertive, assertive, and aggressive as rated by teachers). Although multivariate and univariate analyses indicated increases in social skills and self-efficacy across all grades, there were significant grade x training interactions for drug use and intention. Specifically, social skills training appears to have the most potential for drug abuse prevention with sixth and ninth grade students (see Figures 2 & 3). In addition, training appears to be differentially effective depending on the type of pre-training behavior manifested by students (Table 5). Assertive and aggressive adolescents in social skills training groups reported less frequency, amount, and influence of drug use than other groups. Now in its training follow-up phase, the project is focusing on the continued causal effects of social skills on drug use and the maintenance and generalization of training effects.

Results from this author's research offer evidence for: (1) the sensitivity of social skills and self-efficacy to developmental changes; (2) the relationship of social skills and self-efficacy to drug abuse prevention; (3) system effects on social skills and drug use development; and (4) person, situation, and grade influences on social skills training for drug abuse prevention. The findings suggest that social skills training may be generalizable, as well as individualizable, to different populations of adolescents.

These results are consistent with findings from other social skills training research as reviewed in a paper by Pentz and Tolan (1983). It is this review which serves as the basis for the following section.

GENERIC SOCIAL SKILLS TRAINING WITH ADOLESCENTS

Theoretical and policy changes on deficit prevention in the mid 1970's led to a focus on adolescents for social skills training (Hobbs and Robinson 1982). Early projects tended to include a variety of interventive procedures in addition to social skills training, and were originally intended as treatment programs for rehabilitating delinquent adolescents (for accounts of early programs see for example the PREP program, Filipczak et al. 1979; the Youth Center Project, Jesness 1976; Achievement Place, Kirigin et al. 1979; and Patterson's research with conduct problem youth 1974). The review of research in this section includes these projects as well as 113 other investigations of adolescent social skills training that were conducted over the past decade (1972-1982.[2] The findings are based on a paper by Pentz and Tolan (1983). Several other reviews of adolescent social skills training are also available. As distinguished from the present review, they are primarily descriptive rather than empirical in nature (see Gilchrist 1981; Goldstein et al. 1979; Rotheram 1980; Schinke 1981; and Trower 1978).

Criteria for inclusion in the review were: (1) that a study was

FIGURE 2

CHANGE IN TOTAL DRUG USE FROM PRE-TO POST-TRAINING (N=692)

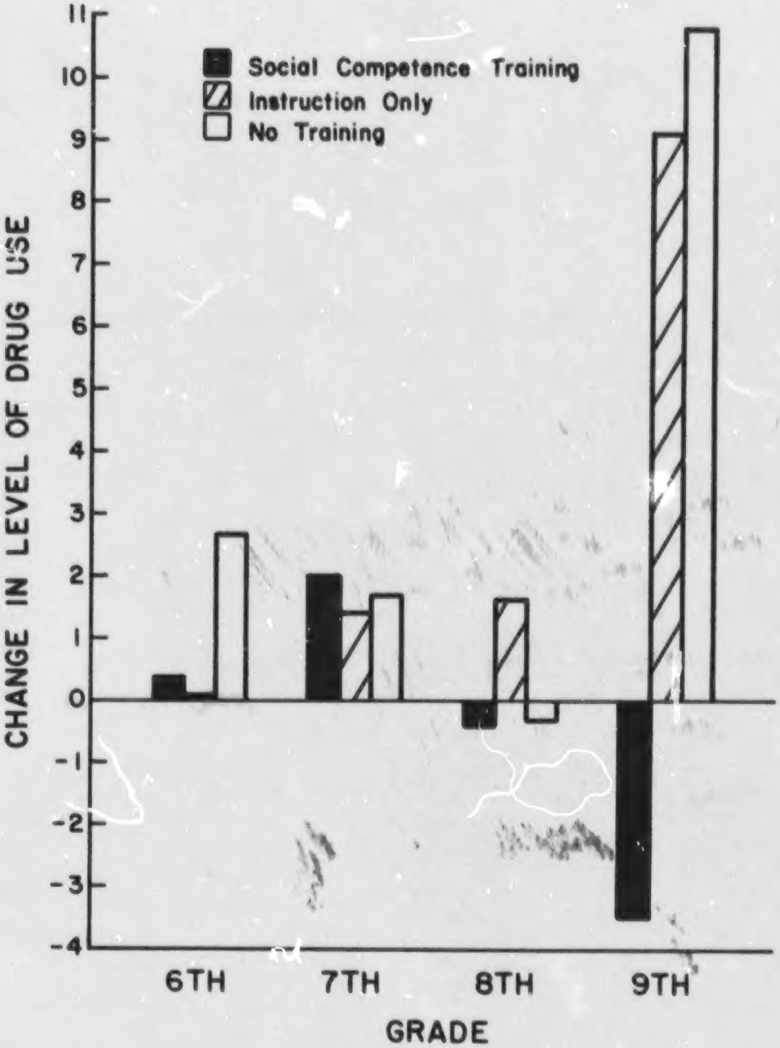


FIGURE 3

CHANGE IN INTENTION TO USE DRUGS
FROM PRE- TO POST-TRAINING
(N=692)

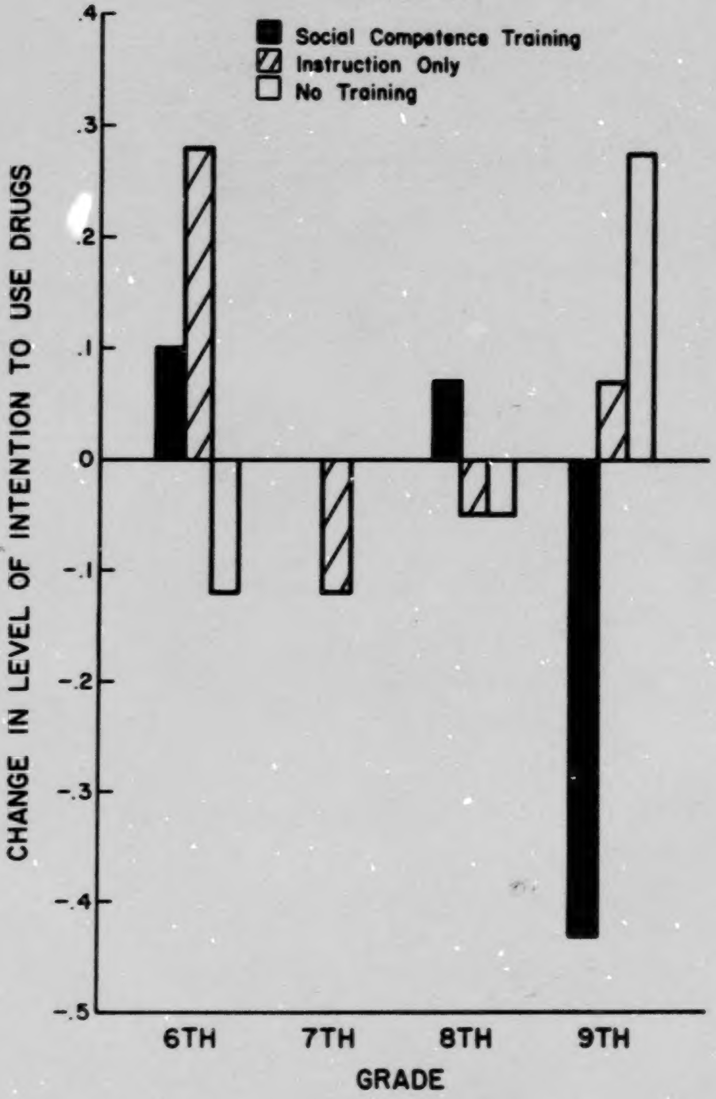


TABLE 5

Training and Pre-Training Behavior Effects on Actual Drug Use

			ACTUAL DRUG USE										
			Amount/Day				Frequency/Last Month				Got Drunk/6 Months		
Source	df^a	Mult. F	Cig.	Beer	Wine	Liq.	Cig.	Beer	Wine	Liq.	Beer	Wine	Liq.
Between													
Training (A)	1	1.60	.88	3.34	1.27	.06	1.22	3.09	.02	2.53	.13	.19	.14
Pre-Training Behavior (B)	2	2.34***	2.70	3.56*	3.49*	.13	2.09	4.11*	1.94	4.15*	1.42	1.06	.90
A X B	2	3.00***	1.57	5.18**	.75	1.38	1.09	6.83***	1.45	5.02**	2.98	1.59	4.02*
Within													
Time (T)	1	2.55**	3.12	1.02	5.84*	1.07	1.21	.07	10.66***	.01	3.94*	3.12	3.38
A X T	1	.33	.17	.35	1.93	.03	.00	.67	.08	.02	.00	.45	.16
B X T	2	1.15	.33	2.03	1.07	.09	2.26	1.16	.65	.34	.70	2.01	1.65
A X B X T	2	1.18	.66	3.74*	.39	1.51	1.60	.49	1.69	.82	1.63	1.17	2.82

*p < .05 ***p < .001
**p < .01 ****p < .0001

TABLE 5 (Cont'd)

Training and Pre-Training Effects on Drug Use Intention

Source	df[a]	Mult. F	Future Intention To Use Drugs			
			Cig.	Beer	Wine	Liquor
Between						
Training (A)	1	1.14	.94	.18	1.06	2.50
Pre-Training Behavior (B)	2	2.11***	1.48	7.46***	8.15***	7.68***
A X B	2	1.81**	3.28*	4.51	3.52*	6.97***
Within						
Time (T)	1	2.51***	1.66	2.15	14.67***	2.14
A X T	1	1.05	4.57*	.03	.08	.08
B X T	2	1.25	.45	.85	.15	.23
A X B X T	317	1.30	.82	.56	.90	1.17

*p < .05 ***p < .001
**p < .01 ****p < .0001

clearly identified as a social skills training study in Psychological Abstracts or ERIC; (2) that the major focus was on adolescents between the ages of 11 and 19; (3) that the study was published in an English-language journal, with a focus on a U.S. population of subjects; (4) that outcome as well as any follow-up was reported; and (5) that dimensional and individual study characteristics were identifiable from the published report. This procedure resulted in 117 studies which served as the basis for macro- and micro-analyses of social skills training characteristics and outcome.

Once identified, studies were classified according to macro-level dimensions of time of publishing (first versus last half of decade), approach (competence enhancement versus remediation), and training focus (single behavioral elements of skills such as eye contact versus combinational skills oriented toward situations such as job interviewing). Time trends were examined to determine the growth rate of adolescent social skills training, since the deficit prevention policies discussed by Hobbs and Robinson (1981) have been in effect, and to evaluate developmental changes in methodology and outcome. The approach dimension was evaluated in order to determine the actual proportion of studies that were prevention versus remediation oriented, whether certain patterns of adolescent or situational characteristics were related to choice of orientation, and whether orientation affected outcomes (see Meichenbaum et al. 1981; Wine 1981). The behavior elements/situation dimension was evaluated in response to other research, suggesting that an ecological (situational) focus of training may enhance outcome and generalization of training (see Sarason 1981).

Studies were further classified by micro-level characteristics. The category of person/situation characteristics settings were labeled clinical, school, or community; subjects were categorized as normal, specific or limited problem (e.g., delinquency, unassertiveness, learning disability), or major emotional/behavioral disorder; and trainers were classified as mental health specialist, teacher, or paraprofessional. In the category of training characteristics, studies were categorized by type of skill trained (positive or positive and negative); change focus (behavior or both cognition and behavior); and training components (modeling or no-modeling included). Within the category of methodology, studies were classified by design (experimental, quasi-experimental, or descriptive); and by measures (behavioral, self-report, or report by others, with the number of measures summed). Finally, in the category of results, studies were classified by reported outcome (partial, no effect, or negative), and by follow-up (yes or no). No study reported negative or null effects; thus only partial and total effectiveness were analyzed.

Chi-squared and Z score proportional difference analyses were conducted on dimensions and study characteristics. In addition, three interval scale scores were generated for discriminant analysis in order to determine the level of conceptual and empirical sophistication of adolescent social skills training research and to assess the relationship of these levels to outcome (see Bloom 1968; Cowen 1980; and Lorion 1982). A community prevention score was derived from setting, subject, and trainer characteristics. A training comprehensiveness score represented the degree to which training included multiple and wide-ranging aspects of social skills and training components. A third score, experimental rigor, represented the level of methodological sophistication of design, measures, and follow-up.

Results are presented in Tables 6-10. As is clear from Tables 6 and 7, the majority of social skills training studies focused on changing behaviors that have been generally regarded as related to drug use (see Jessor and Jessor 1977; Smith and Fogg 1978).[3] Consistent with factor analytic findings on the structure of social skills (Pentz 1981a), the most frequently targeted skills were general prosocial behavior, assertiveness, and initiating conversation. Table 8 and subsequent tests for proportional difference indicated more adolescent social skills training research conducted in the second half of the decade and a greater representation of situational (ecological) approaches to training. Slightly, but non-significantly, more studies were aimed at deficit remediation rather than competence enhancement. However, both types of studies were characterized by an emphasis on positive skills (and thus long-term prevention). The majority of studies was also characterized by a high level of methodological rigor (experimental or quasi-experimental designs, and multiple measures), in contrast to findings from several reviews on psychotherapeutic interventions. Finally, over 93% of the studies reported total effectiveness (improvement on all measures or for all subjects when subjects rather than measures were reported). Furthermore, almost half of the studies conducted follow-up assessments of training effects. Follow-up ranged from under six weeks to almost five years, and all reported maintenance and/or generalization effects.

Tables 9 and 10 show the results of chi-square and discriminant analyses respectively. Results indicated increases over time in prevention, methodological rigor, and training comprehensiveness. Enhancement studies, particularly, were characterized by high scores on these variables, as was positive outcome. Finally, in terms of specific study characteristics, better training outcomes were associated with the use of school or community settings for training, normal subjects as trainees, and modeling as a training component.

SOCIAL SKILLS TRAINING FOCUSED DIRECTLY ON ADOLESCENT DRUG USE

This body of research is new and thus far limited in scope. Specifically, this research is characterized by training which included social skills as they were directly applied to drug abuse prevention (e.g., training refusal skills for the specific purpose of refusing drugs in an interpersonal situation involving a drug use opportunity), and/or by the integration of social skills with other drug abuse prevention methods. For example, Botvin et al. (1980) have employed life skills training that includes aspects of both social and health problem skills. This type of training has

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TABLE 6

Frequency of Adolescent Social Skills Training Studies by Reason for Referral

Reason for Referral	N	(%)
Past Correlates of Drug Use		
Delinquent Behavior	31	(26.65)
Aggressive Behavior Problem	16	(13.68)
Emotional Disturbance	14	(11.97)
Passivity/Withdrawal	11	(9.40)
Family Conflict	6	(5.13)
Achievement Problems	4	(3.42)
Drug Use	1	(.85)
Reasons Not Directly Related to Drug Use		
Retardation	16	(13.68)
Physical Handicap	6	(5.13)

No Referral - Enhancement Only	12	(10.26)

TABLE 7

Frequency of Adolescent Social Skills Training Studies by Primary Target for Change

Skill Target	N	(%)
General Prosocial Behavior	26	(22.22)
Assertiveness	20	(17.09)
Initiating/Maintaining Conversation	15	(12.82)
Non-Verbal Expression	13	(11.11)
Expressing Feelings/Empathy	12	(10.26)
Decision-Making	12	(10.26)
Expressing an Opinion or Request	7	(5.98)
Self-Control	5	(4.27)
Praise	4	(3.42)
Responding to Criticism	3	(2.56)

TABLE 8

Frequency of Adolescent Social Skills Training Studies by Dimensions and Individual Characteristics

	N	(%)	Dimension	N	(%)		N	(%)
Time[a]			**Behavior/Situation**			**Remediation/Enhancement**		
1972 - 1976	41	(38.67)	Behav. Elements	26	(22.22)	Remediation	67	(57.27)
1978 - 1982	65	(61.32)	Situation	91	(77.78)	Enhancement	50	(42.73)
			Person/Situation Characteristics					
Setting			**Subject**			**Trainer**		
Clinical	35	(29.91)	Normal	14	(11.96)	Ment. Hlth. Spec.	74	(63.25)
Community	41	(35.04)	Spec. Problem	46	(39.32)	Teacher	16	(13.68)
School	41	(35.04)	Major Disorder	57	(48.72)	Paraprof/Student	27	(23.07)
			Training Characteristics					
Skill			**Focus**			**Training Components**		
Positive Only	94	(80.34)	Behavior Only	90	(76.92)	Modeling	49	(41.88)
Positive & Negative	23	(19.66)	Cognit. & Behav.	27	(23.08)	No-Modeling	68	(58.12)
			Methodology					
Design			**Measures**					
Experimental	41	(35.04)	Single	35	(29.91)			
Quasi-Experimental	58	(49.57)	Multiple	82	(70.09)			
Descriptive	18	(15.38)						
			Results					
Outcome						**Follow-up**		
Total	100	(85.47)				No	68	(58.12
Partial	17	(14.53)				Yes	49	(41.88)

[a] With the exception of the time analysis (N=106), all analyses were based on N=117.

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TABLE 9

Time Trends, Dimensional Differences, and Outcome in Adolescent Social Skills Training (χ^2 Analyses)

Source	df	Time	Behavior/ Situation Dimension	Deficit/ Enhancement Dimension	Outcome
		(N=106)	(117)	(117)	(117)
Person/Situation Characteristics					
Setting	2	6.92*	6.01*	16.59***	5.19*
Subjects	2	1.59	2.60	18.24***	15.03***
Trainers	2	3.08	1.30	1.22	2.60
Training Characteristics					
Skill	1	4.00*	3.59	8.52**	.31
Focus	1	.84	5.65*	5.87*	2.27
Components	1	2.18	8.28*	3.67	4.50*
Methodology					
Design	2	9.28**	4.39*	5.37*	3.94
Measures	1	5.36*	6.43*	.64	2.20
Results					
Outcome	1	1.54	1.97	1.44	--
Follow-up	1	1.82	.00	.54	.04

*p < .05
**p < .01
***p < .001
****p < .0001

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TABLE 10

Step-wise Discriminant Analysis of Time, Dimensions, and Outcome by Community Prevention Training, Comprehensiveness, and Experimental Rigor Scores (_F_ Tests)

Source	df	F to Enter	Overall
Time			
Step 1 Prevention	1,104	5.72*	14.36** (df=3)
Step 2 Rigor	2,103	6.46**	
Step 3 Comprehensiveness	3,102	5.11**	
Deficit/ Enchancement (DE)			
Step 1 Prevention	1,115	10.91***	12.32** (df=3)
Step 2 Comprehensiveness	2,114	6.51**	
Step 3 Rigor	3,113	4.32**	
Behavior/ Situation (BS)			
Step 1 Rigor	1,115	3.02	6.49 (df=3)
Step 2 Comprehensiveness	2,114	2.99	
Step 3 Prevention	3,113	2.22	
DE X BS			
Step 1 Prevention	3,113	3.60*	16.92* (df=9)
Step 2 Comprehensiveness	6,224	2.43*	
Step 3 Rigor	9,270	1.92*	
Outcome			
Step 1 Comprehensiveness	1,115	5.33*	8.40* (df=3)
Step 2 Rigor	2,114	4.34*	
Step 3 Prevention	3,113	2.89*	

*p < .05
**p < .01
***p < .001
****p < .0001

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shown prevention of onset of cigarette smoking in early adolescents and reduction of smoking intentions.

Others have incorporated social skills training into peer training, psychological inoculation, and pressure resistance approaches (e.g., Hawkins 1981; McAlister et al. 1979; Perry and Murray 1982; Wodarski and Lenhart 1981). These studies have shown delays in onset of drug use, and reduction of intentions to use drugs, and reductions in actual use once it has begun.

Finally, a few studies have assessed the effects of social skills training as a unitary approach to drug abuse prevention (Schinke and Blythe in press; Schinke and Gilchrist in press; Williams and Horan 1981). Results of this research have shown that training for social skills such as assertiveness in a peer pressure situation leads to decreased drug use, decreased intention to use drugs, and improvement in drug use-related behaviors such as aggression.

Review of the studies in this section suggests that social skills training, whether conducted alone or in combination with other approaches, is a viable means for preventing drug abuse in adolescents. However, little is known about the relative effects of social skills training that is directly focused on drug use, training that is combined with other approaches such as drug education, generic social skills training, and non-skill-oriented approaches to drug abuse prevention. Future research should focus on comparing these approaches in order to determine their immediate and long-term benefits.

FUTURE DIRECTIONS FOR RESEARCH

The review of adolescent social skills training research raises several issues that are pertinent to future research efforts in the area of drug abuse prevention with youth. These issues encompass conceptual, methodological, and evaluative domains and are approached from the perspective of maximizing training effectiveness and improving the benefit-to-cost ratio involved in conducting preventive research.

First of all, there is a question as to the developmental stability of the social skills construct, and whether its salience and priority in the developmental sequence of drug use behaviors changes over time. Friedenburg (1980) has cautioned that social skill training may be regarded during some age or grade periods as a means to force adolescents to do what is socially sanctioned. Whether or not the meaning of social skills changes during the course of youth and whether its effect on subsequent behavior like drug use changes in immediacy or strength can be examined in several types of investigations. For example, Cunningham (1982) has suggested techniques for evaluating factor invariance and its relationship to behavior change. Epstein (1980) has suggested summing and weighting techniques to determine both the stability of developing behaviors such as social skills and drug use, and the effects of intervention on several extra-training domains of functioning. Curran (Curran et al. 1979) has suggested evaluating the generalizability of social skills and training effects across experimental laboratories as well as areas of subject functioning. This appears to be especially important in the determination of agreement on what is meant by social skills, replicability of training effects, and generalization across different geographic and demographic areas. Others have suggested evaluation of the social validity of constructs and training, i.e., assessment of adolescents', parents', and professionals' opinions of the utility of social skills and training for drug abuse prevention (Minkin et al. 1976). Finally, Froman and Hubert (1980) have suggested evaluation of the developmental sequencing of decision-making in order to determine the strength and immediacy of influences on behavior change.

Another area that warrants further research is that of training prescriptiveness (person, situation, environmental, and developmental considerations that affect training outcome). For example, although generic social skills training research indicated that normal adolescents and community/school settings yielded the most positive outcomes on drug use-related behaviors, little is known of the contribution of type of adolescent to training effects on drug use (cf. LaGreca and Mesibov 1979). Also in question is whether different types of trainers (e.g., peer versus teacher versus parent) or different levels of training involvement (e.g., student versus student and one or both parents) affect drug use differentially (cf. Pentz 1980a; Iverson et al. 1978). The effects of behavioral style are additional person variables that have been suggested as having an influence in causal modeling of drug use (Huba et al. 1980). Finally, demographic variables, particularly suburban/rural differences in social skills and training effects, should be researched further. Several investigators have suggested that drug use development in adolescents from these areas may differ not only in level, but also in conceptualization (cf. Levine and Kozak 1979; Winfree et al. 1981). Evaluation of whole communities as factors in social skill development and drug abuse prevention is also open to question (Kim 1982).

The final area that is relatively unexplored involves effects of social skills and other drug abuse prevention programs which are dove-tailed by age and grade for the purpose of maximizing training impact in the face of expected developmental changes (see Zigler and Cascione 1977). Pursuit of this area of research will require basic assessment of the validity and reliability of interventions at each grade (see for example, Bloom 1968; Cowen 1980; and Lorion 1982), comparison of different models of helping and coping (e.g., compensatory and enlightenment, Brickman et al. 1982), and integration of community and developmental concepts in research as they relate to youth (Grinder 1982; Masterpasqua 1981).

FOOTNOTES

[1] Programmatic techniques were adapted from Goldstein et al.'s (1979) Structured Learning Training (SLT) methods for behavior change in adolescents.

[2] See Appendix for the 117 studies included in the review.

[3] Studies that actually represent a history of multiple investigations of adolescent social skills training as it applies to drug use-related behaviors include: Filipczak et al. 1979; Goldstein et al. 1978; Jesness 1976; Kirigin et al. 1979; Pentz 1980; Rotheram 1981; Sarason and Sarason 1981; and Spence and Spence 1980.

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APPENDIX. INVESTIGATIONS OF ADOLESCENT SOCIAL SKILLS TRAINING, 1972-1982: STUDIES INCLUDED IN THE REVIEW

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Preventing Adolescent Substance Abuse Through Drug Education

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The belief that education can solve social problems has been longstanding despite a lack of supportive evidence (Goodstadt 1981; Noble 1978; Woodcock 1973). This belief is based on the assumptions that social problems are caused by the maladaptive behavior of individuals, and that such behavior can be influenced by education. The public schools are considered a logical setting for primary prevention because their major goal is education, and they service a young population that is relatively problem-free. The present paper examines the efficacy of drug education as a preventive solution to the problem of substance abuse. The substances of interest include alcohol and cigarettes as well as psychoactive drugs taken for non-medical reasons.

Drug education, which first appeared in the public school curriculum in the 1880's, has largely consisted of didactic instruction about psychoactive drugs and their use (Globetti 1974). The information taught has been relatively accurate given available knowledge during all but two decades. In these decades, the 1890's and 1960's, drug education could best be characterized as "scare tactics" because much misinformation was conveyed in an attempt to prevent substance abuse through fear arousal (Bukoski 1979; Wepner 1979). Neither approach, however, has been successful in preventing a general increase in the incidence of substance abuse (Kinder et al. 1980; Plant 1980).

By the mid-1970's, in response to better knowledge about the correlates of substance abuse, drug education was re-conceptualized as "a well-defined and structured learning process that assists individuals to develop the affective skills they need to help themselves" (Bukoski 1979). Information about drugs and their effects became secondary to the development of psychosocial skills related to problem-solving, decision-making, values awareness, stress reduction, and interpersonal communications.

THEORETICAL APPROACHES

Most drug education programs have been based upon at least one of three theoretical approaches to behavior change: a knowledge/attitudes approach, a values/decision-making approach, or a social competency approach. The knowledge/attitudes approach has been used most widely. This approach assumes that increased knowledge about the consequences of substance use produces more negative attitudes toward use which, in turn, reduce the likelihood of use. Recent research has concentrated on two variants of this approach: Fishbein's behavioral intentions model (Fishbein and Ajzen 1975) and McGuire's persuasion-communication model (McGuire 1964, 1974). Fishbein's model assumes that behavior is a volitional act. The model specifies that the intentions to perform a given behavior are the immediate determinants of that behavior. Furthermore, intentions to engage in an activity are considered to be a function of attitudes toward the activity and related subjective norms. McGuire's model postulates a sequence of six steps for behavioral change. The target population must 1) be exposed to a persuasive communication; 2) attend to the material; 3) comprehend its contents; 4) agree with its conclusions; 5) retain the induced agreement; and 6) act accordingly. The model addresses the factors that facilitate this process, including the objectives, source, and content of a communication. It specifies important characteristics of the audience and of the mode through which the communication is presented (such as face-to-face or mass media). For example, if one's goal is to produce sustained attitude change, then presenting both sides of an argument (cognitive inoculation) may be more effective than presenting one side. Also, a communication may be more effective if the communicator is perceived to be credible, attractive, and powerful (McGuire 1974).

With regard to substance use, there is little empirical support for the causal links implied by the knowledge/attitudes approach (Goodstadt 1981; Hanson 1980; Kinder et al. 1980). Schlegal and Norris (1980) subjected adolescents to persuasive communications regarding their beliefs about marijuana use. They found that only some beliefs were amenable to change and that where attitude change was successful, intentions and behavior change did not follow. Longitudinal research indicates that this approach fails to account adequately for the influence of prior substance use on subsequent use (Bentler and Speckart 1979). Furthermore, drug-related behavior is fairly stable over time (Huba et al. 1980, 1981). Intentions explain little of the variance in subsequent use after controlling for prior use (Bentler and Speckart 1979; Huba et al. 1981; Schlegel et al. 1977), suggesting that adolescent substance use is not necessarily a consciously planned behavior. Discussing the potential effects of drug education on drug use, McGuire has concluded that:

> Attitudes are perhaps a partial determinant of action... However, drug use in young people is probably not the most rational area of human behavior. An individual's decision to use drugs in a given situation derives from many factors, not just his general belief system regarding drug usage. (McGuire 1974, pp. 23-24)

In contrast to the knowledge/attitudes approach, which focuses on the activity (i.e., drug use), the values/decision-making approach focuses on the individual. This model promotes self-examination of one's needs or values and of the roles that substance use serves in fulfilling these values. The objective is to decrease the likelihood of substance use through promotion of self-understanding and responsible decision-making. Research on adolescents provides limited support for this approach inasmuch as logical introspection regarding the costs and benefits of substance use has not been found to be highly predictive of subsequent use (Huba et al. 1980). Moreover, there is little empirical evidence to support the efficacy of this approach with regard to drug education (Goodstadt 1981), health education (Governali and Sechrist 1980), moral education (Leming 1980; Lockwood 1978), or interpersonal problem-solving (Urbain and Kendall 1980). Evaluation studies have found this approach to be ineffective in influencing values organization, self-esteem, or behavioral adjustment.

The most recent approach to drug education, social competency, assumes that individuals abuse substances because they lack appropriate psychosocial skills. This approach recognizes that individuals create their environment by choosing social situations and partners, by processing social information in these situations, and by their interpersonal behavior (Meichenbaum et al. in press). Bandura's theories (1977a, 1977b, 1978, in press) regarding social learning, reciprocal determinism, and self-efficacy, have heavily influenced conceptualizations about social competency. However, little research has been conducted in this area; thus, knowledge about the relationships between social cognition and social behavior is limited (Ford 1982). Research has been hampered by an inability to develop reliable and valid measurement procedures (Bellack 1979; Urbain and Kendall 1980).

Applications of the social competency approach to drug education have featured two techniques: modeling health-promoting behaviors and teaching skills to resist social influences (e.g., peers and family) that promote drug use. Although a substantial body of research suggests that these influences are major determinants of drug use (Botvin and McAlister 1982; Braucht 1980; Glynn 1981; Gorsuch and Butler 1976; Kandel 1980; Radosevitch et al. 1980), little research indicates how these influences actually operate (Botvin in press; Braucht and Braucht 1982; Huba et al. 1980; Jessor 1982). This latter knowledge is necessary to develop effective programs. For example, programs that teach students to be assertive assume that students are pressured by their friends to use drugs. In what is likely the best study to have examined this issue, the investigator concluded that an adolescent's selection of friends plays as important a role as conformity pressure (Kandel 1978). Inspection of the data reported in this study reveals that most friendship pairs (85%) were initially congruent with regard to marijuana use. In most of the initially incongruent pairs, where one member initially used marijuana and the other did not, marijuana use did not change at posttest (44%) or both members became nonusers (34%); in only 17% of these pairs did both members become users. Thus, there is much more evidence for selection and positive peer influence in this study than there is for negative peer influence. This evidence calls into question the utility of assertiveness training for preventing marijuana use.

In sum, the theoretical approaches to drug education have little empirical basis. Whereas the knowledge/attitudes models have been researched considerably, the evidence for the causal links in these models is inconsistent. Furthermore, there is little support for the validity of these models as applied to adolescent drug use. The values/decision-making and social competency models have not generated much research. Thus, the assumption that adolescents abuse drugs because of their deficient values, their inept decision-making, or their inadequate social skills is unfounded. There is also little evidence that such deficiencies can be remedied through education.

EVALUATION RESEARCH

The drug education evaluation literature has been reviewed extensively (Evans et al. 1979; Goodstadt 1980; Hanson 1980; Kinder et al. 1980; Mackintosh et al. 1981; Rothman and Byrne 1981; Schaps et al. 1981; Staulcup et al. 1979; Thompson 1978). Based upon these reviews several conclusions are warranted. First, drug education programs have been largely ineffective in preventing substance use or abuse. Whereas many programs are effective in increasing drug knowledge, very few programs influence drug attitudes, and even fewer influence drug use. Second, most studies suffer from serious methodological weaknesses which undermine internal validity, or the ability to make inferences about program effectiveness. These shortcomings include inappropriate control groups and statistical analyses, small sample sizes, sizeable attrition rates, and inadequate measurement procedures. Third, most evaluation reports neither specify the program's goals and objectives nor describe the target population. Furthermore, the reports provide only superficial program descriptions, and the studies do not evaluate program implementation. These shortcomings make it difficult to interpret the meaning of results or to determine their generalizability.

Our own research on drug education overcomes many of the methodological problems that have plagued prior studies. In two experimental studies evaluating different drug education courses, classes were matched on the basis of pretest drug use and attitudes and then randomly assigned to condition. Pretests and multiple posttests were administered to collect self-report data on a variety of drug-related variables including knowledge, utilities (i.e., perceived positive and negative consequences), perceptions of peer attitudes and peer use, attitudes, intentions, and use. Survey administration procedures that maintained subject identifiability without introducing response bias were utilized (Malvin and Moskowitz, in press). These procedures enabled sensitive covariance analyses to be conducted as well as analyses of the effects of attrition. Data were analyzed at the class level and/or student level with class as a random factor. This contrasts with prior studies that have conducted student-level analyses assuming that students are statistically independent, an assumption that is rarely warranted (Hopkins 1982; Judd and Kenny 1981). Finally, implementation of the courses was documented, and feedback regarding the courses was obtained from students via interviews or questionnaires.

Both courses primarily were based upon a values/decision-making approach with a secondary emphasis on knowledge and attitudes. The second course also taught relevant social competencies. In the first course 7th and 8th grade students were taught decision-making skills, a framework for understanding needs, alternative methods for dealing with problems and stress, and information regarding the emotional, social, and physical consequences of substance use (primarily alcohol, cigarettes, and marijuana). In the second course 7th grade students were taught decision-making skills, personal goal setting, a model of motivation, peer and media influences on behavior, assertiveness training, and information on the consequences of, and alternatives to substance use. Special instructors taught the courses in 10 or 12 weekly sessions conducted during social studies classes.

The process evaluation revealed that the first course was too complicated for many students as the curriculum was "abstract, difficult, and dense" (Schaps et al. 1982). The outcome evaluation revealed that the first course produced several of the predicted effects for 7th grade girls but not for the other sub-groups. As compared to their controls, the 7th grade experimental girls had greater drug knowledge, perceived more negative peer attitudes toward alcohol, cigarette, and marijuana use, and were less involved in use of alcohol and marijuana. However, all of these effects disappeared at follow-up one year after completion of the course (Moskowitz et al. in press-c).

The second course was evaluated in two studies. The first evaluation was a quasi-experimental study in which drug education was administered in conjunction with other prevention strategies. Because these other strategies were found to be ineffective, the results of this study appear to be attributable to drug education (Moskowitz et al. in press-d). In this study all 7th grade students in one school received drug education, and 7th grade students from another school served as a comparison group. Student feedback regarding this course was superior to the first course. Positive effects were found on girls' drug knowledge, their perceptions of peer attitudes toward and peer use of drugs, and their cigarette smoking. Experimental boys exhibited greater drug knowledge but no other differences attributable to the course. At follow-up one year later the knowledge effects were sustained for both sexes. In addition, the effect on girls' cigarette smoking was sustained as well as two of the effects on the four perceived peer attitude and peer use measures.

The final study evaluated the second course with two instructors; each taught the course to randomly selected classes in two different schools. For males, no effects were obtained at posttest;

however, five months later at follow-up, positive effects were found on three of the four perceived peer attitude and peer use measures. For females, no effects were found at either posttest or follow-up.

Some general conclusions can be drawn from this research. Drug education was more effective for girls inasmuch as their substance use was positively affected by both courses. However, these behavioral effects were sustained at follow-up only for cigarette use. The behavioral changes were accompanied by increased knowledge and changes in perceived peer attitudes toward drug use, but not by attitudinal changes. Finally, the only replicable effects occurred for girls on drug knowledge and perceived peer attitudes toward drug use, but even these effects failed to be replicated in the final study. In sum, the inconsistency of these findings does not provide a clear direction for future research.

CIGARETTE SMOKING PREVENTION

In contrast to the limited evidence for the efficacy of drug education programs on alcohol and drug use, there has been considerable evidence for the efficacy of cigarette smoking education on cigarette use. Six studies have found positive effects on cigarette smoking (Arkin et al. 1981; Evans et al. 1981; Flay et al. 1983; Hurd et al. 1980; McAlister et al. 1980; Perry et al. 1980) with programs that share a common theoretical basis in social learning theory (Bandura 1977b) and persuasive-communication/cognitive-inoculation theory (McGuire 1964). The programs consisted of 5-11 sessions in which 7th grade students learned about the short-term effects of cigarette smoking and learned to identify and to resist the social influences that promote cigarette use.

In these programs positive peer behavior was modeled by trained peers who led discussions (Arkin et al. 1981; Hurd et al. 1980; McAlister et al. 1980; Perry et al. 1980) or appeared on film (Arkin et al. 1981; Evans et al. 1981; Hurd et al. 1980). Programs without peer models have also been effective in preventing cigarette smoking (Arkin et al. 1981; Flay et al. 1983); thus, peer models are not necessary to obtain the effect. Perhaps the modeling that naturally occurs when students, particularly early adolescents, discuss substance use is as important to the efficacy of these programs as the use of trained peer models.

Another common feature of these programs has been assertiveness training. Students are taught cognitive and verbal strategies to resist social pressures to use drugs and then rehearse these strategies. While there is evidence that such programs prevent cigarette use (Botvin and Eng 1982; Botvin et al. 1980; Hurd et al. 1980; McAlister et al. 1980; Perry et al. 1980), it is unclear whether this component is responsible. Other programs have obtained this effect without teaching assertiveness (Arkin et al. 1981; Evans et al. 1981). Because no study assessed assertiveness, it is not known whether students even acquired these skills. Some research also suggests that individuals do not use assertive behaviors that have been taught (Bellack and Hersen 1978; Bellack et al. 1979) because they expect to be rebuffed (Fielder and

Beach 1978; Kelly et al. 1982). Covington (1981) has criticized use of this technique in drug education: "The assertive social skills taught to resist peer pressure appear calculated to alienate children from the very peer groups with which they must ultimately satisfy their needs for affiliation and competency."

Despite the consistent effects obtained in these studies, it is premature to conclude that these programs are effective in preventing cigarette smoking. No study has demonstrated effects on habitual cigarette smoking which does not occur until the high school years (Evans et al. 1979). Furthermore, these studies have utilized weak non-equivalent control group designs in which all 7th graders in one (or several) school(s) received the treatment, and those in one (or several) other school(s) served as a control group. Most studies obtained pretest substance use data only on cigarettes and only for 7th graders. Given the limited cigarette involvement of this age group, these data are inadequate to establish the initial equivalence of treatment and control schools. Without such knowledge, pre-existing school differences are a plausible alternative explanation for treatment-control differences at posttest. Had pretest substance use data been collected at all grade levels the research designs might have permitted stronger inferences about treatment effects by combining longitudinal and cross-sectional designs (Tuckman 1979, pp. 52-55). Besides employing a weak research design, the studies suffered from high rates of attrition and utilized inappropriate statistical analyses. Thus, from a methodological standpoint, these studies are typical of prior research on drug education.

Nevertheless, the consistent results strongly suggest the effectiveness of curricula that focus on psychosocial influences related to smoking and provide information about the short-term effects of smoking. However, this is not the only promising approach for preventing cigarette smoking. One study that contrasted several versions of this approach with a more traditional program that presented the long-term health consequences of cigarette smoking found the latter program to be most effective in reducing the onset of experimental smoking (Arkin et al. 1981). Evaluations of a program that presented the short- and long-term effects of smoking and taught students various psychosocial competencies (decision-making, relaxation training, social skills training, self-improvement) have also found positive effects on experimental cigarette smoking (Botvin and Eng 1982; Botvin et al. 1980). Finally, our second drug education course obtained positive effects on girls' cigarette smoking when the course was delivered to all 7th grade students in a school, but no effects were found when only half of the students received it (Moskowitz et al. in press-d). In sum, since the mid-1970's, a variety of programs has been evaluated that appears to be effective in preventing cigarette smoking among early adolescents.

The current social climate regarding cigarette smoking may be essential to the success of recent programs in preventing cigarette smoking. During the past few decades the climate regarding cigarette smoking has shifted dramatically towards a general belief that people should not smoke (Russell 1978). This normative change has been attributed to a sustained anti-smoking campaign in which persistent anti-smoking publicity has been supported by changes in public policy regarding cigarette legislation (Warner 1977, 1981). Behavioral manifestations of the present "non-smoking ethos" are evidenced by a decline in per capita cigarette consumption since 1973 (Warner 1981), and a decreased prevalence of "current" (past month or 30 days) cigarette smoking among 12-17 year old youth since 1974[1] and among high school seniors since 1976[2].

Successful cigarette smoking programs capitalize on the non-smoking ethos in one of two ways. Most programs have used cognitive inoculation, a persuasive-communication technique that has only been effective in reinforcing "cultural truisms," or beliefs that are generally accepted in the culture (Tedeschi and Lindskold 1976). In most programs the social influences that promote smoking are discussed. Such discussion may debunk students' exaggerated misconceptions about the prevalence of smoking and teach them that most peers and adults (smokers and non-smokers alike) share their negative attitudes toward smoking.

Two additional factors contributed to the success of the programs: the recipients were early adolescents, and all students in a grade level participated. According to McGuire (1974), early adolescence is the age of greatest susceptibility to the types of persuasive communications used in drug education. Because most of this age group are strongly opposed to smoking and few are habitual smokers, the information provided on the effects of smoking reinforces pre-existing attitudes. Having all students in a grade level participate ensures that most of an individual's peers are affected by the curriculum. This should alter the peer group norms to coincide with the individual's anti-smoking attitudes, hence, reducing the likelihood of smoking. In one study, student interviews revealed that "the intervention may have influenced the entire 'social atmosphere' regarding smoking" (Botvin and McAlister 1982, p. 236). Perry et al. (1980) also recognized the program's influence on peer group norms; "The long term benefits appear to be a community where smoking is no longer the acceptable norm" (p.5).

FUTURE RESEARCH AND DEVELOPMENT

The potential effectiveness of drug education may be a function of the substances addressed by the program. Success in preventing the abuse of substances other than cigarettes may await changes in the social climate towards those substances. New prevention approaches are required because other substances fulfill different psychosocial functions (Braucht 1980). These functions need to be researched before relevant drug education programs can be designed (Bernstein et al. 1972; Dembo 1979; Jessor 1982; Newman et al. 1982; Plant 1980).

Program effectiveness may also be a function of student characteristics including age or grade level (Braucht and Braucht 1982; Braucht et al. 1973; Dembo 1979), sex (Braucht and Braucht 1982;

Moskowitz et al. in press-d; Schaps et al. 1982), psychological or behavioral development (Braucht and Braucht 1982; Braucht et al. 1973; Goodstadt 1980), prior substance use (Blum et al. 1978; Braucht and Braucht 1982; Braucht et al. 1973; Dembo 1979; Johnson in press), and "problem behavior" involvement (Jessor 1982). Such individual differences create practical problems for program design and implementation because programs are usually delivered to intact classes which include a wide variety of students. One solution is to develop comprehensive programs that address the specific needs of each subgroup (Botvin in press; Huba et al. 1980; Jessor 1982). However, such programs may require substantial resources, including highly trained instructors or discussion leaders. Furthermore, this may be a difficult task if requisite program components or instructional objectives are incompatible (e.g., teaching abstinence to some students and responsible use to others).

Research and development efforts will have little payoff to society unless the problems associated with program adoption and dissemination are resolved. Our evaluations of various school-based primary prevention programs conducted by teachers who received inservice training revealed substantial variation in classroom implementation (e.g., Moskowitz et al. 1982, in press-a,b,d; Schaps et al. in press). The Follow Through evaluation, a study of 22 compensatory education models conducted in 158 school districts, found that a given program's effects depended more upon local circumstances than upon the particular model it employed (Patton 1979). Rothman and Byrne (1981) cited six references to support their concern about the competence of teachers to provide instruction in health education. Others have expressed concern about the administrator's (Blum 1976) and the teacher's role in implementing drug education programs (Evans et al. 1979; Goodstadt 1980; Johnson in press).

Whereas there is a burgeoning literature about the obstacles to educational innovation, there is little consensus as to appropriate solutions (e.g., Berman and McLaughlin 1974-1978; Papagiannis et al. 1982). Prior research has failed to evaluate program implementation adequately; thus, recommendations about procedures to facilitate program adoption and implementation have little empirical basis (Scheirer and Rezmovic 1982). Demonstration research in drug education could contribute to the solution of this problem by evaluating program implementation in addition to program outcomes. Such research could help to determine how much and in what manner a program can deviate from its ideal plan and still manage to meet its basic objectives (Patton 1979).

A QUESTION OF GOALS

Drug education may embrace a variety of goals such as promoting abstinence, delaying onset of use, teaching "responsible use" or informed decision-making, insulating use from its negative consequences (e.g., eliminating drinking-related traffic accidents), and substituting health-promoting behaviors for health-compromising behaviors (Jessor 1982; Jessor in press). From a cognitive standpoint some goals may be easier to achieve than others. For example, abstinence, the primary goal of anti-smoking programs, is a simpler message to communicate than "responsible use," the goal of many alcohol education programs. Also, abstinence may require fewer and less sophisticated psychosocial skills to achieve. Although there are relevant educational, psychological, and health considerations, the choice of goals is ultimately ideological. Because of the current campaign against smoking, this has been an easy decision with regard to cigarettes. In contrast, there has been little consensus as to which goal is most appropriate regarding use of the other "gateway" substances, alcohol and marijuana (Braucht and Braucht 1982; Carroll 1981; Chng 1981; Unterberger and DeCicco 1968). As a consequence, most drug education programs neither specify nor operationalize behavioral objectives regarding use of these substances (Braucht et al. 1973; Goodstadt 1981; Noble 1978). This shortcoming not only makes it difficult to evaluate these programs, it may also contribute to the failure of these programs to influence student drug use.

The source of dissension about prevention goals is a social climate that sustains a variety of inconsistent beliefs, values, and norms regarding substance use and abuse. This heterogeneous climate manifests itself politically in a complex body of civil and criminal law pertaining to the use, possession, and sale of substances. The assumptions about substance abuse underlying these laws are contradictory, making it difficult to design drug education programs that communicate a logically consistent message (McGuire 1974).

In providing drug education to youth, it is assumed that students will have to make decisions regarding their personal drug use. This message is communicated implicitly if not explicitly. That it may facilitate student experimentation with drugs is a matter of practical concern. Goodstadt (1980) identified 15 studies wherein drug education had a negative attitudinal or behavioral effect. Positive effects were also obtained in these studies, leading him to suggest that, "It is possible that some 'negative' impact of drug education programs has to be tolerated as the price for programs which are more broadly beneficial (e.g., decision making programs)" (p.96). However, if this is to be the cost of drug education, the public may be unwilling to pay for it. For example, the National Federation of Parents for Drug-Free Youth, a coalition of over 3000 parent groups, recently ratified a series of resolutions "that reject any education, prevention or treatment program that advocates or condones responsible use of illicit drugs, including the use of alcohol by minors" (Vejnoska 1983). Professionals also disagree about prevention objectives. A group of experts on marijuana convened by NIDA concluded that, "Children and adolescents are simply not in a position to understand the risks or deal with the decisions involved in marijuana use" (Carroll 1981).

A consensus regarding prevention goals may help us decide whether to put our efforts into drug education or other prevention approaches. Achieving such a consensus should expedite program design and implementation. Moreover, it could serve as a first step toward the creation of a more consistent social climate regarding drug use.

FOOTNOTES

[1] National Household Survey on Drug Abuse, 1982: Summary of Selected Findings, *NIDA Capsules*, National Institute on Drug Abuse. Rockville, MD: Press Office, 1983.

[2] High School Senior Drug Use: 1975-1982, *NIDA Capsules*, National Institute on Drug Abuse. Rockville, MD: Press Office, 1983.

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Discussion and Recommendations

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The problem of adolescent drug abuse has received a great deal of attention during the past decade. Beginning in the late 1960s the prevalence of drug use has increased dramatically. This steady upward trend which lasted until the late 1970s has been called "The Drug Epidemic" by the popular press. This epidemic has spread largely among adolescents (12 to 17 years) although young adults (18 to 25 years) were also affected. Despite a decline in adolescent drug use since the late 1970s, drug abuse among youth remains a problem. For example, the 1982 National Institute on Drug Abuse (NIDA) National High School Survey, conducted by the University of Michigan, revealed that 6% of high school seniors reported daily use of marijuana in 1982, which is down from 11% in 1978 (Johnson 1982).

In an effort to counteract this epidemic, during the 1970s drug abuse prevention needs were identified, and a variety of prevention programs were initiated. Many of these programs were funded at the State level. The early programs included four types of strategies: information, education, alternatives, and early intervention. Values clarification and decisionmaking were popular program components. These two components were generally utilized in generic primary prevention programs which made no reference to drugs or drug use. Due to the urgency of the drug problem, programs were adopted despite a lack of empirical evidence to support their efficacy in preventing drug abuse.

A number of demonstration research projects were conducted during the 1970s to evaluate the effectiveness of substance abuse prevention programs. However, most of these projects did not conduct adequate evaluations. Although the programs generally were not found to be effective, the results can be attributed to weak methodology (Schaps et al. 1981).

In recent years health promotion and disease prevention have received considerable attention. The 1979 Surgeon General's report, Healthy People (USDHEW 1979), attributed as much as 50 percent of mortality to unhealthy lifestyles which include drug abuse along with other factors. Reducing the misuse of drugs (and alcohol) has been identified as one of the 15 health objectives for the nation. In keeping with this objective, the nation's drug prevention policy is to encourage actions by every segment of society that will help to avoid starting, or to stop, the misuse of drugs. Adolescence has been chosen as one of the four target areas for service and research emphasis.

The present monograph on adolescent prevention research and the associated 2-day review meeting had several goals: 1) to evaluate the major modalities/approaches for prevention interventions in the area of adolescent substance use; 2) to identify specific approaches or combinations of approaches which have the greatest potential for effectiveness, taking into consideration such issues as cost, ease of application, and size of target audience; and 3) to make suggestions for program dissemination.

Interventions to prevent adolescent substance abuse can be categorized in many ways. For this monograph the prevention approaches have been categorized as follows: Alternative Activities, Drug Education, Media, Social Skills, Values, Health Promotion, Life Skills, Community, and Social Psychological. Each author prepared a paper that evaluated the research related to one of the above areas. The purpose of this chapter is to summarize the discussion that occurred at the review meeting.

RESEARCH METHODS AND RESULTS

The discussion focused on two types of interventions, alternatives and anti-cigarette smoking education. This focus did not, however, reflect a lack of interest in other preventive interventions. In fact, the general sentiment was that sound research should be encouraged on all theoretically based interventions, particularly on comprehensive approaches that address the multiple risk factors associated with drug abuse.

Few evaluations of alternatives have been conducted, and most have been methodologically unsound. More importantly, alternatives have been so loosely conceptualized that this intervention could entail virtually any licit activity. Alternatives must be chosen in a manner that reflects the current state of theoretical knowledge regarding the etiology of drug abuse. Although alternatives directly focused on preventing drug abuse typically have been introduced during adolescence, they may be more effective with younger groups because the predisposition to abuse drugs probably develops earlier. Alternatives could be utilized to promote a sense of self-efficacy, i.e., to instill the belief that mastering one's environment can bring satisfaction. Finally, alternatives can serve an important and unique function in the context of a comprehensive health promotion program.

Although the research on anti-cigarette smoking education has not been methodologically strong, recent findings suggest that several programs have effectively delayed the onset of cigarette smoking among early adolescents for up to 3 years. Preliminary evidence indicates that reductions in alcohol and marijuana use have also been found. The successful programs provided training in intrapersonal and interpersonal competencies believed to be related to early cigarette use (e.g., decisionmaking and assertiveness). In addition, the programs provided information about the social influences that promote cigarette smoking and about the immediate physiological effects and social consequences of smoking.

Future research on anti-cigarette smoking programs should investigate the efficacy of these programs on minority populations, as most prior research has been conducted on white middle-class adolescents. The programs may need to be adapted for different subcultures. Some concern was expressed that the curricula are too dependent on verbal skills; however, the use of peers to model appropriate behaviors could mitigate this potential problem. Concerns were also raised about the increased difficulty of conducting research in schools that service an economically disadvantaged population.

A goal for future research is to determine why these anti-smoking prevention programs have been effective. The promising programs are based upon somewhat different models; their curricula contain many components, and they utilize different modes of implementation. Few studies, to date, have contrasted the different models, components, or implementation approaches. One study suggests that the use of peer leaders is necessary for a program to yield sustained effects. Prior research also indicates that program effects are attenuated when students are exposed to a different social environment; e.g., when students enter high school. Thus, booster courses may be required.

In order to revise the underlying models, future evaluations should assess the hypothesized mediating processes (e.g., changes in norms and behavioral competencies). It is unclear to what extent the effects of a program are attributable to its influence on peer norms via aggregate attitude change or to its influence on individuals' knowledge, attitudes, and competencies. Research on some of the mediating variables will require development and validation of new assessment techniques.

Future studies should also include process evaluation to examine program implementation procedures. Such information will not only be useful in revising programs but also in providing information to those who wish to replicate these programs.

In sum, research on preventive interventions is in its infancy due to theoretical and methodological inadequacies. Few interventions are theoretically based. Furthermore, program evaluations are rarely designed to test theory, as most studies do not contrast different models of intervention, nor do they assess program effects on mediating variables. Most evaluations have suffered from weak research designs. Whereas most studies evaluate program effects, few studies evaluate program implementation. The result of these shortcomings is that there is little knowledge regarding (a) how prevention programs actually operate; (b) which programs have been effective; (c) why certain programs have been effective; and (d) whether these programs are likely to be effective in other settings or with other populations.

DISSEMINATION AND IMPLEMENTATION

The most vigorous discussion addressed dissemination of those prevention programs for which preliminary research support exists. Given existing community and State needs for drug abuse prevention programs, a desire was expressed to develop program "packages" which would assist agencies in implementing the most promising programs. The primary programs considered for dissemination were the cigarette smoking interventions developed and evaluated by Botvin 1980; Evans 1981; Johnson 1981; McAlister 1979; Perry 1980; and others.

There was considerable reluctance, however, to endorse or recommend any prevention approach for dissemination. The primary concern was that no program has been evaluated in enough different contexts to warrant ample confidence in its effectiveness. Furthermore, the implementation of a program can vary considerably, and some adaptations of a program may render it ineffective or make it harmful to recipients.

Evaluating different dissemination approaches was suggested to better understand the potential societal impact of prevention research. Such research should first examine existing approaches, including the National Diffusion Network sponsored by the Department of Education and the National Institute on Alcohol Abuse and Alcoholism replication models.

RESEARCH RECOMMENDATIONS

The following research recommendations were made during the course of the discussion. The purpose of this summary is to suggest some directions in which prevention research methodology and design can proceed. The following statements are merely representative of the suggestions made at the review meeting and do not reflect a consensus.

- Disseminating promising drug abuse prevention programs is a complex matter that is not well understood. Program dissemination should be accompanied by research that evaluates different dissemination approaches with regard to process, outcome, and impact.

- Promising prevention programs should be evaluated in minority communities.

- Comprehensive community prevention intervention studies should be developed which "mix and match" interventions in an effort to test quality, quantity, and timing of interventions.

- Drug-specific variables should be assessed at followup in ongoing health promotion intervention studies.

- Prevention research evaluation strategies, methods, and designs require further development.

- Followup studies of effective interventions should be continued and expanded in order to understand more fully the duration and strangth of these interventions.

- Methodologies from health promotion intervention studies should be incorporated into drug abuse community studies.

- The use of media techniques in connection with other interventions should be pursued.

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